products finishing

MARCH
1960

Industry Leaders Discuss New Plating Methods, Specifications . . . Page 146

Coloring Anodized Aluminum	Page 32
Today's Paint Strippers	Page 39
Improved Nickel Bath	Page 45
Painting Assembled Aircraft	Page 50
Table of Contents	Page 5

finishes on metal products

ROHCO® Conversion Coatings

. . . FOR BETTER FINISHES
. . . FOR LASTING PROTECTION

ROHCO developments in powder conversion coatings offer a wide variety of low cost finishing effects — Brightening, Corrosion Protection and Paint Bonding— for:

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RODIP ZN-25—A one dip (no leach) process which produces a definitely bluish coating.

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RODIP CD-4—Primarily for rapid manual operation. No leach. Imparts a new, brilliant, clear, stain-free finish with good corrosion protection.

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ask Oakite

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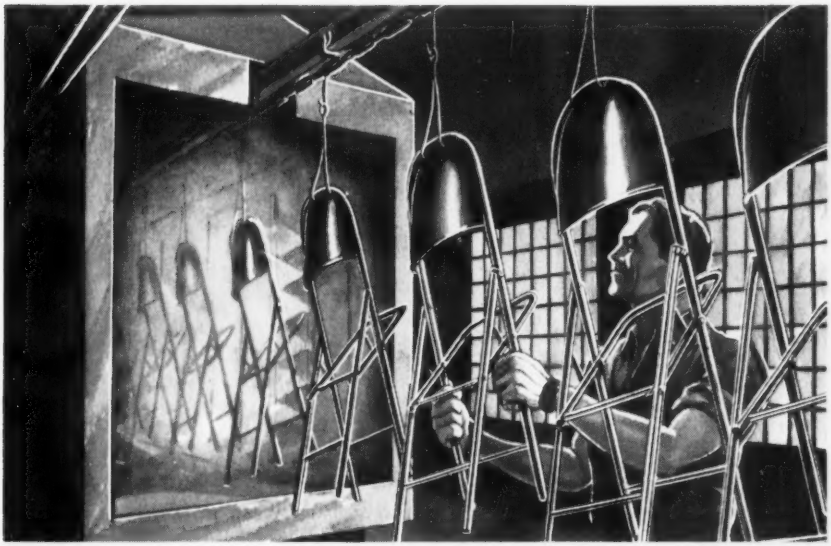

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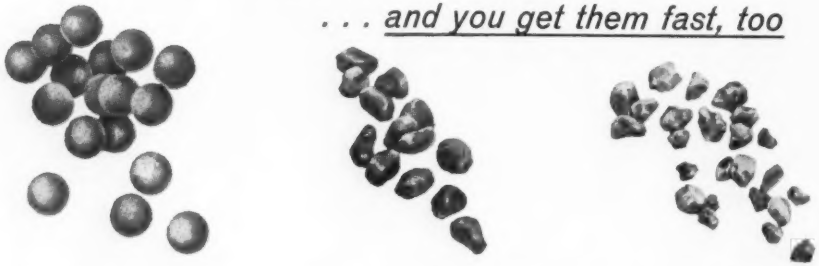
. . . and you get them fast, too



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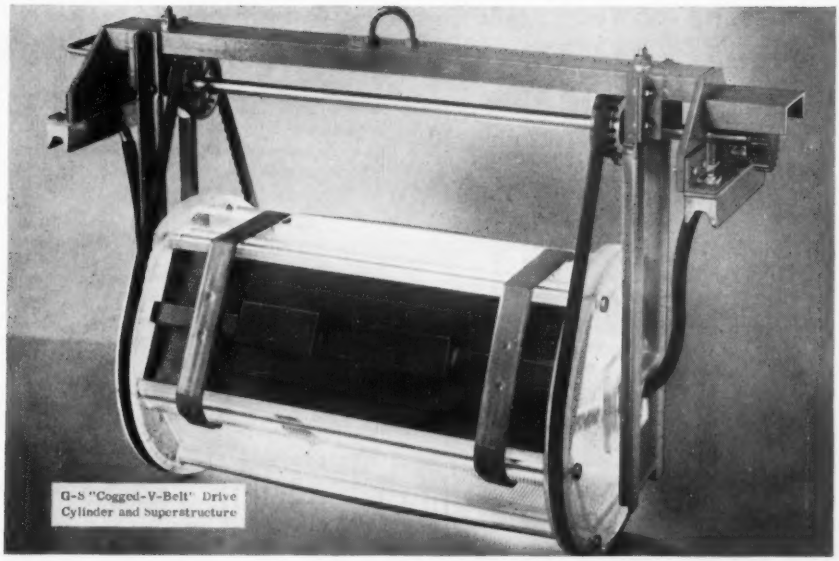

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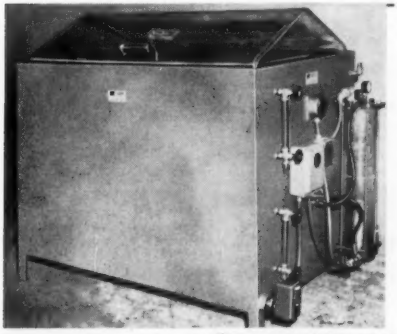

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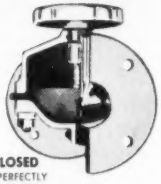

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products finishing

Vol. 24 No. 6 March, 1960

FEATURES IN THIS ISSUE:

31 AUTOMATIC TEMPERATURE CONTROL: A STEP TOWARD UTOPIA • *Editorial*

32 TECHNIQUES FOR COLORING ANODIZED ALUMINUM • *By R. V. Vanden Berg*

39 PAINT STRIPPING TECHNOLOGY TODAY • *By L. J. Durney*

45 NICKEL BATH WITH GOOD TOLERANCE FOR IMPURITIES

50 PAINTING ASSEMBLED AIRCRAFT • *By Ogle French*

54 WHAT PRECISION BARREL FINISHING CAN DO • *By J. J. Forrester, Jr.*

58 TRAVELING-BOOTH PAINT SHOP AT BELL HELICOPTER CUTS PAINTING TIME

62 ALUMINUM BUS BAR CUTS COST FOR ANODIZER

64 HOW PESCO PRODUCTS IMPROVED DEBURRING

6 ADVERTISING REPRESENTATIVES

38 REPRINTS AVAILABLE

DEPARTMENTS:

72 NEW EQUIPMENT, MATERIALS, PROCESSES

124 FREE LITERATURE

142 CLASSIFIED ADVERTISING: POSITIONS AVAILABLE; USED MACHINERY; PROFESSIONAL CARDS; SERVICES

143 NEWS OF THE FINISHING INDUSTRY

165 MEETINGS OF INTEREST TO FINISHERS

166 THE FINISHING TOUCH

168 MARCH ADVERTISERS' INDEX

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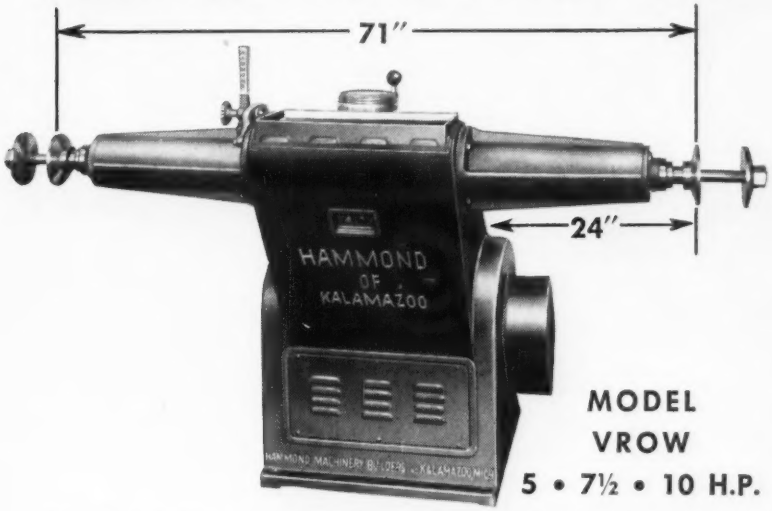

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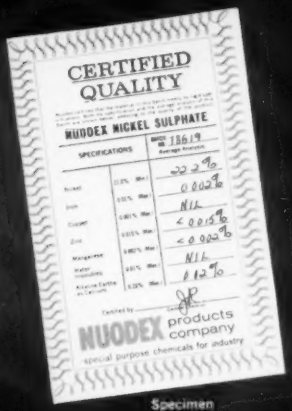

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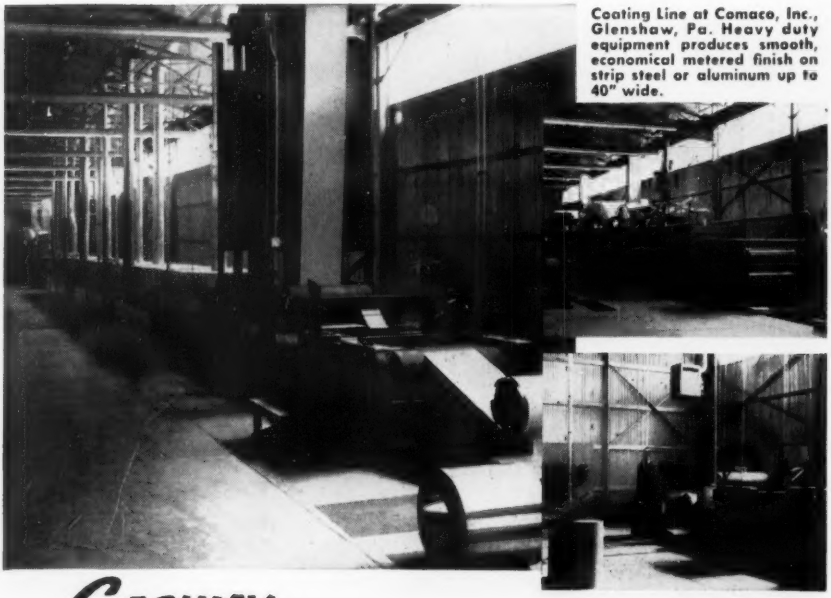

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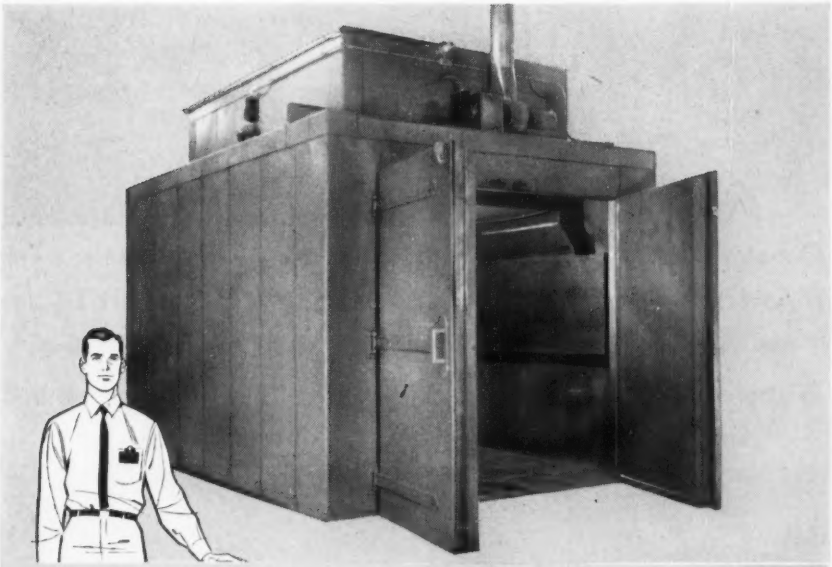

System-designed equipment by Pennsalt pays off on your finishing line...

Because we supply both metal processing machines and chemicals, we are uniquely qualified to treat your metal finishing line as an integrated system. This System Approach brings you peak production, top quality, lowest costs, maximum flexibility.

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COMPARE Grav-i-Flo's Finishing Prior To Decorative Plating!

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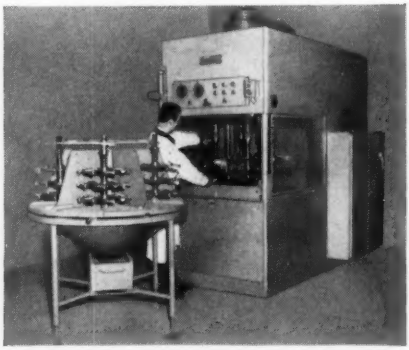
Grav-i-Flo exclusive barrel finishing materials make it possible to obtain finishes in a tumbling barrel that no other process can produce. Grav-i-Flo chips are the most outstanding of all barrel finishing medias on the market for decorative finishing. Many customers ultilize Grav-i-Flo's plant facilities for job tumbling of parts on which they have been unable to obtain satisfactory finishes, and later install their own facilities.

SPIN-FINISH



Large parts, intricate shape parts not suited to tumbling and previously finished only by buffing, are now finished in production quantities to high lustre surfaces with Grav-i-Flo's Spin-Finish machines. This short automatically timed operation offers tremendous savings in schedules, labor and floor space. No set-up time required for changing jobs. This is a completely dry process, dust and fume free, eliminating exhaust systems.

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for better finishes prior to decorative plating. Grav-i-Flo personnel were the pioneers—and are still the leaders in tumble finishing.

GRAV-I-FLO CORPORATION

PF-3 Sturgis, Michigan

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a complete line of dependable gold plating solutions for electrical and decorative applications

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NEWARK, N. J.

Atomic Number	79
Atomic Wgt.	197.20
Crystal Structure	Face center cubic 4.07A°
Density	20°C = 19.3 G/CM³
Melting Point	1063°C
Specific Resistance	13.2 OHMS/MILL/FOOT
Thermal Conductivity	0.71 c g s UNITS (20°C)
Coef. Linear Expansion	14.2 Micro Inches /°C (20°C)
Hardness	Rockwell 15 T Scale = 24
Tensile Strength	P.S.I x 1000 = 18
Magnetic Susceptibility	.15 x 10⁻⁶ C.G.S. Units (18°C)

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EXECUTIVE OFFICES:
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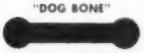
AMERICAN PLATINUM & SILVER DIVISION

these anodes are extruded and shaped to lower plating costs

ROLLED FLAT PLATE ANODE SECTION:
This Photomicrograph shows highly irregular, uncontrolled grain size—a major cause of shedding and resultant rough electrodeposits.

EXTRUDED ANODE SECTION:
Note small, fully controlled regularity of grain size that promotes uniform corrosion, smoothest electrodeposits, less rejects.


"DOG BONE"

"RECTANGULAR"

"TEAR DROP"

These scientifically shaped anodes retain 80% of original active surface area after 85% by weight has been plated off!

Costs are lowered by prolonged anode life, minimized polarization and less silver scrap to be refined. In addition, the AP & S Extrusion Process controls grain size within definite ideal limits so that corrosion is smooth and uniform. Electro-deposits are consistently smooth. Shedding is virtually eliminated. Rejects are a comparative rarity!

We are anxious that the silver you buy in anodes is used most efficiently and economically. Special anode shapes will be engineered to meet your particular plating bath conditions. Call or write for a representative. We'll be glad to assist with your plating problems.

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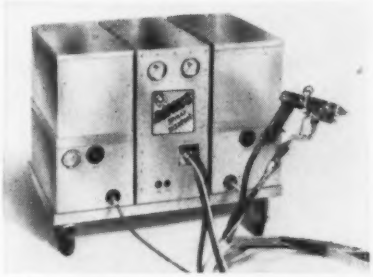
sprays or flows the new MULTIPLE COMPONENT MATERIALS for finishing, coating or build-up

Binks new TURBULATOR spray gun and FORMULATOR are a major break-through in the spray application of a whole array of catalyzed epoxy coatings and casting resins . . . polyester gelcoats and reinforcing resins . . . foam-in-place materials and other synthetic coatings requiring a catalyst.

Binks TURBULATOR gun may also be used for the flow-on application of plural component materials.

The FORMULATOR provides a self-contained reservoir for resin and catalyst materials. It accurately meters and proportions the flow and volume of each material to the TURBULATOR spray gun.

Operation is simple . . . only basic instruction is necessary.



Binks new TURBULATOR gun and FORMULATOR equipment package opens up vast new areas of finishing, coating and build-up material technology . . . for the first time really places this technology at your disposal . . . opens up exciting new production possibilities never before practical.

Send for Bulletin A-54-5

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0307

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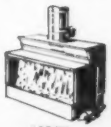
SPRAY GUNS



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For FINISHING
Any and All
FERROUS and NON-FERROUS MATERIALS . . .

HILL Polishing Machine
(Hydraulic Table Type)
For polishing individual sheets and plates. Hydraulic reciprocating table with centralized controls.

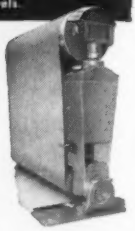
FLAT surfaces of ferrous or non-ferrous material can be brought quickly to the high finish so necessary for today's industrial and consumer products. The dairy, automotive, home appliance and engraving industries are typical of the wide range of application for these precise, labor saving machines.

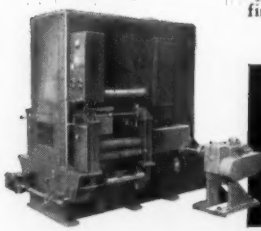
HILL abrasive belt grinding and polishing machines are built in two general types. The hydraulic reciprocating table type polished individual sheets and plates. Table widths vary from 36″ to 60″. Table lengths range from 60″ to 240″. The Pinch-Roll type is for progressive line polishing. The HILL two-roll vertical head with endless abrasive belt is the basic principle common to both types.

When writing for information please indicate size and specifications of stock to be finished.

The basic HILL two-roll vertical head with upper steel idler roll and lower rubber covered contact or work roll (both dynamically balanced) over which the endless abrasive belt travels.

MMT-PE





HILL Grinding and Polishing Machine
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For pre-finishing, conditioning and polishing. Used as single units or in multiple units for progressive line polishing in wet or dry operations.

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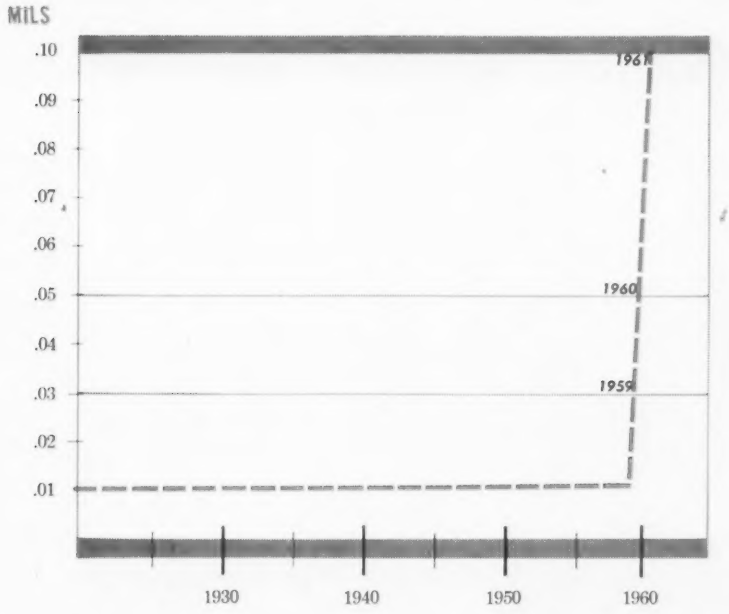
For increased corrosion resistance follow the trend to thicker decorative chromium plating...



with MUTUAL CHROMIC ACID

Yes, the trend is to thicker chromium plating to produce increased resistance to outdoor exposure economically. Today's reports indicate that the thicker chromium plating shown in the simplified graph above makes possible a marked increase in the desired corrosion resistance *without* a proportionately high increase in plating costs. And the sales appeal of your product *goes way up!*

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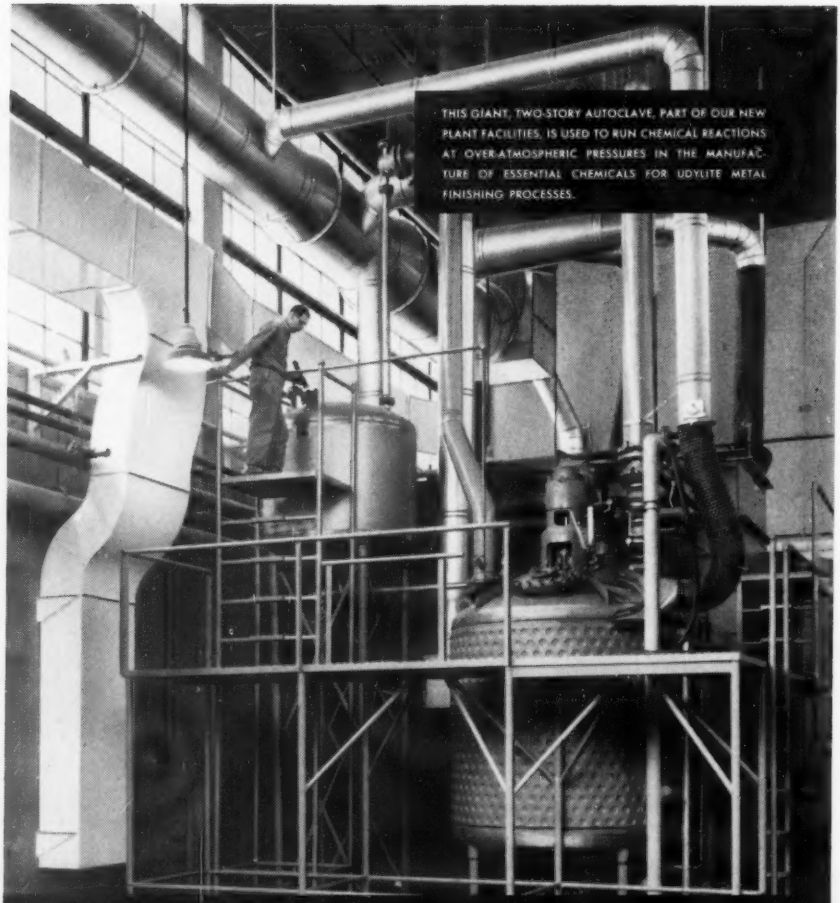

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Invested in your future:

It cost that much to complete additional new plant facilities at Udylite in order to guarantee you: 1—absolute purity of product, 2—stringent quality controls, 3—reasonable price schedules. Now you can *depend* on these benefits from Udylite for years ahead, as our industry expands.

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New Processes due Another great forward step in the battle against corrosion . . . A NEW Udylite bright plate process . . . now under rigorous testing for introduction early in the spring . . . a product of the continuing research and development that gave you "The Incomparable 66" and Bi/NICKEL.

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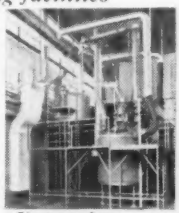

Giant autoclave . . . new plant facility at Udylite

The newest and the best in plating supplies, equipment and processes . . . products such as those shown here flow constantly from Udylite to industry. Watch for detailed announcements every month. If you'd like to learn more about any of the developments we've talked about right away, just get in touch with your Udylite man today or write to:

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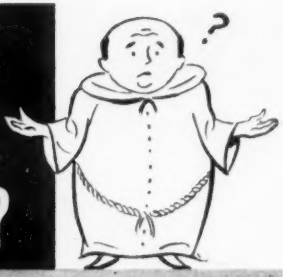
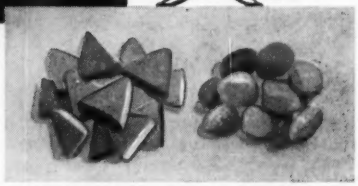
The Abbot asks you: What's right for your product... FINISH...or CUT?





When metal products or parts need a polished, mirror-like, glass-hard *finish*, steel burnishing should be used . . . not synthetic abrasives, which have comparative application superiority only when *cutting* is what's wanted.

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For extreme accuracy in masking parts for all plating cycles.

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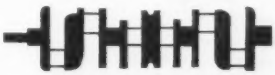
Provides complete masking protection for hard chromium plating.

MICCROPEEL
A special lacquer that can be peeled easily from parts after all plating cycles.

MICCROWAX
Two waxes widely used for selective stop-off. C-562 for hard chromium; C-600 for high-temperature cycles.



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MICCROTAPE
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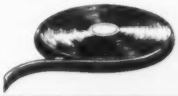

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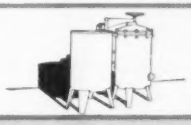
Corrosion-resistant industrial maintenance paint.



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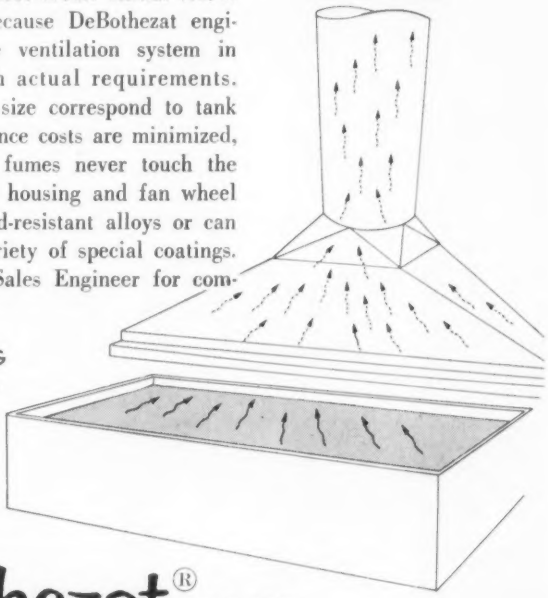

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A DIVISION OF

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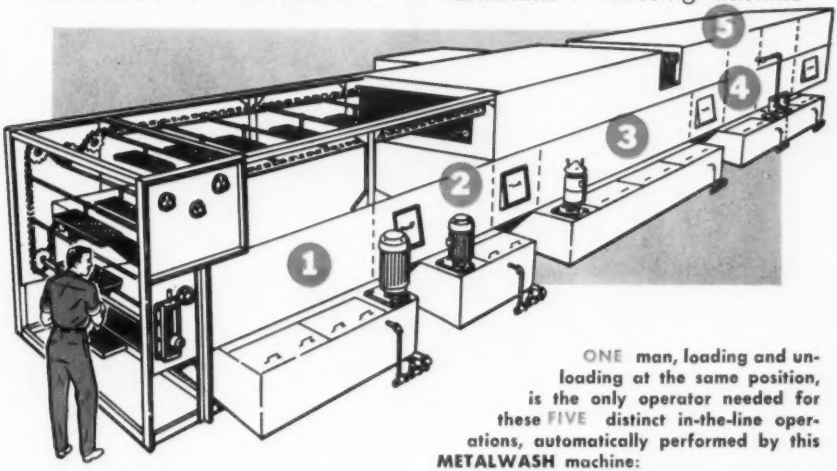
with this new *Metalwash*® **Automatic** Processing Machine



ONE man, loading and unloading at the same position, is the only operator needed for these FIVE distinct in-the-line operations, automatically performed by this METALWASH machine:

This is the actual record of a METALWASH automatic Metal Processing Machine which was recently installed for a nationally-known brake shoe manufacturer.*
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THE PREMIUM BRIGHT NICKEL BATH

we admit it . . .
There may be other baths as bright
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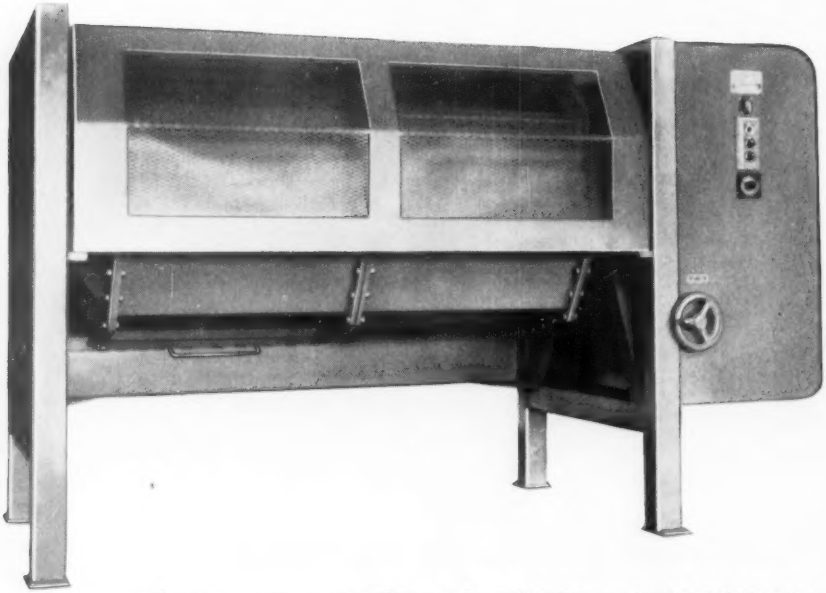
New Rampe 36" Finishing Machine



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PRECISION BARREL FINISHING MACHINES

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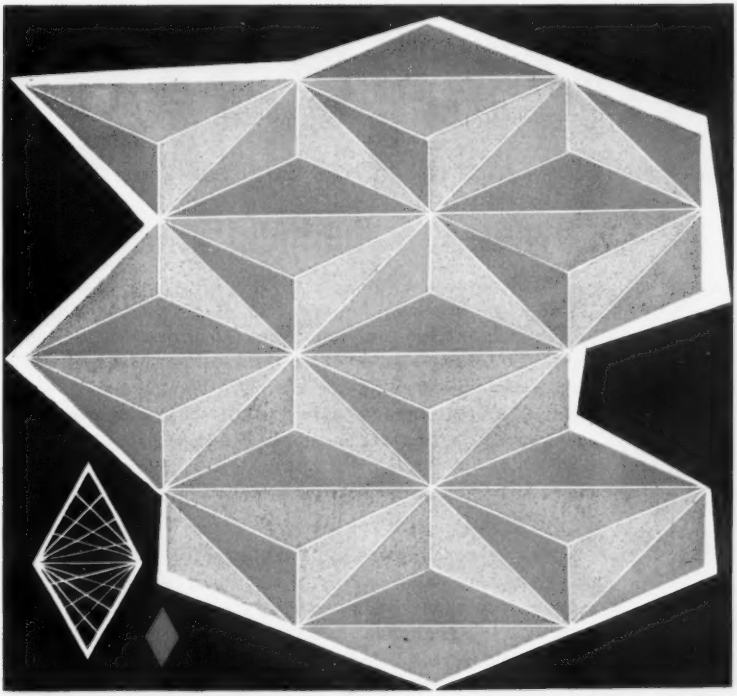

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AK ETCHES, with *ease* and *efficiency!* This unique formulation works on all aluminum alloys and *prevents formation* of aluminum oxide scale by means of a special sequestering agent. No more scale means no more down-time for costly clean-up . . . less chance for coil and tank damage in maintenance . . . better temperature control . . . longer solution life, with lower product consumption . . . greater operational safety through the elimination of mid-shift dumping. Cowles AK gives a more uniform finish for plus results through easier inspection, quality improvement and increased end product sales appeal.

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Automatic Temperature Control: A Step Toward Utopia

Every finisher dreams of complete automation. In this Utopia, a given set of automatically controlled processing conditions would unvaryingly produce the required film thickness, surface smoothness, hardness and other requisites of quality. The finisher could assure his customer that *every* part coming from his automatically controlled system would meet specifications. And he'd have no rejects.

While the finishing industry is progressing toward this goal, complete automation is not yet within sight. Certain components of such a system are already part of the finisher's existing equipment, however. Automatic temperature controls are one of these.

Today's temperature control is a classic example of automation in the true sense of the word. It monitors temperature and sends out impulses which activate heat exchangers, burners, coils, and compressors. When these units have heated or cooled the solution or oven enough to bring the temperature back into the preset range, the temperature control stops them.

In a relatively short time, temperature controls have become standard equipment in most finishing installations. They regulate temperatures of solutions used for pickling, cleaning, phosphatizing, plating, anodizing and sealing. They make possible hot spray and viscosity control of paints used in flow coating. In baking paint and firing porcelain, temperature controls are indispensable.

Temperature controls are so common now that we take them for granted. But we should remember that they have eliminated one process variable and thus contributed importantly to this industry's progress toward Utopia.

Ezra A. Blount

—EDITOR

Techniques for Coloring Anodized Aluminum

Alloy Selection • Surface Preparation • Anodizing Conditions • Coloring Process • Sealing Methods

By R. V. VANDEN BERG
Finishes Section
Alcoa Process Development Laboratories
New Kensington, Pa.

Part II

Coloring Process

Considering the fact that anodic coatings are composed essentially of aluminum oxide, of which alundum is one form, it seems strange that such a substance can be colored. Generally, such substances are considered to be impervious and non-adsorptive. But coatings formed by anodic oxidation in electrolytes that have appreciable solvent action on the oxide are adsorptive.

The porous cellular structure of anodic coatings has been mentioned previously. It is this characteristic that enables colorants to penetrate into the oxide coating. Thus the anodic coating may be colored with organic dyestuffs (generally from water solutions).

Colored anodic coatings have an attractive metallic sheen imparted by the metallic luster of the underlying metal. If the alloy selection is such that a relatively transparent coating is formed, then the coating will have the greatest metallic sheen, assuming that the electrolyte used does not produce an opaque anodic coating.

As mentioned previously, rinsing anodic coatings prior to coloring is important in obtaining consistent shade and color uniformity. If the anodized shapes are complicated and have areas where the electrolyte may be entrapped, clean water rinses are required. Agitation of the parts or air agitation of the water will facilitate the removal of residual electrolyte. Sometimes immersion in nitric acid or other solutions is used as a means of obtaining greater uniformity of shade. After rinsing, the surfaces should be immersed in the dye

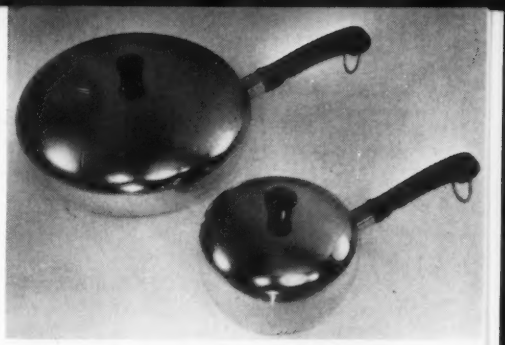
solution while still wet. Allowing the anodic coating to dry introduces the possibility of shade variations. Partial drying is being used successfully as a method for producing multicolored work such as nameplates. It is a highly specialized technique, however, which must be used with care for uniform results.

Prolonged exposure to rinse water before coloring will result in partial sealing of the anodic coating and less adsorption of the dyestuff. For this reason, efficient well-agitated rinses that remove residual electrolyte in the shortest possible time are recommended.

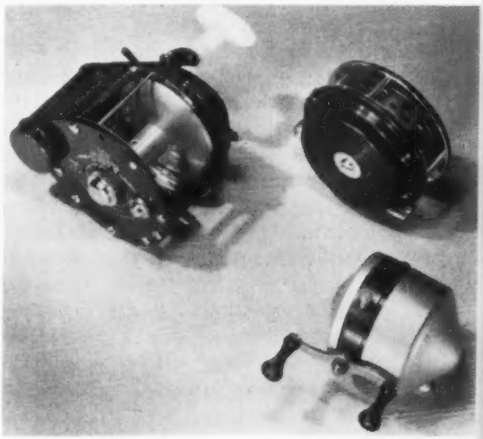
The most common commercial procedure for coloring anodic coatings is immersing the anodized part in a water solution of the dyestuff at elevated temperature. Other techniques such as spraying, swabbing, printing, screening or roller coating are used for specialized applications.

The important factors which influence the coloring process are good rinsing prior to coloring, the type of dyestuff, its concentration, temperature and pH. Agitation, immersion time and rinsing after coloring are also important.

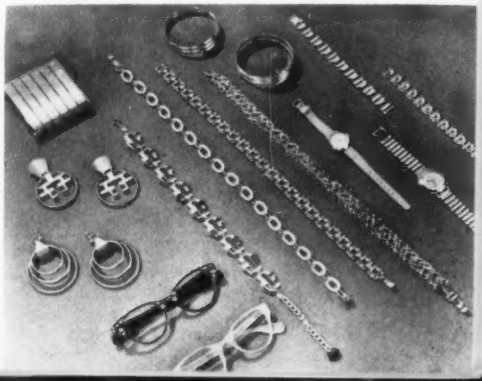
The dyestuffs most often used for coloring anodic coatings are known as the acid type. Their pH is usually between 4.5 and 6.5. Generally, a dye with a pH outside the range of 4-8 is not recommended because strongly acid or alkaline solutions will attack the anodic coating. There is an optimum pH range for every dyestuff. At this pH best results are attained in respect to uniformity and lightfastness. Variations in pH change the shade. Manufacturers' recommendations on pH should be followed if consistent shade is required.



Wear-Ever Hallite cooking utensils with buffed bottoms and copper-colored Alumilite covers are typical color-anodized products.



(Above) Fishing reels with plain and colored Alumilite finishes. (Below) Aluminum jewelry items with various colored Alumilite anodic finishes are both attractive and durable.



"Recent evidence seems to indicate that longer immersion provides more uniform shades and better lightfastness."

The subject of lightfastness of organic dyestuffs is quite complex and is beyond the scope of this discussion. It is important to note, however, that wide variations exist in the performance of various dyestuffs in this respect. Fade-resistant dyes made by several commercial dyestuff suppliers should be used as recommended if lightfastness is an important consideration.

Various concentrations of dyestuffs may be used, with higher concentrations producing darker shades. Darker shades also are produced by higher dye-solution temperatures, but care must be taken that the solution temperatures are not over 150 deg. F. If they are, partial sealing of the anodic coating will occur, resulting in less adsorption and variations in shade. In this connection, it might be well to mention the use of boiling dye solutions for coloring. Using this technique, the anodic coating may be colored and sealed in the same operation. A later discussion about sealing anodic coatings will explain the mechanism of this procedure.

Agitation of the dyestuff is essential in order to assure temperature uniformity within the dye solution. Air agitation is generally used. Some dyestuffs, however, are sensitive to aeration and will coagulate. In these cases, stirring is more satisfactory.

The time of immersion is of extreme importance. Longer immersion results in darker colors. Recent evidence seems to indicate that longer immersion provides more uniform shades and better light-fastness. If lighter shades are desired, it is still possible to use longer immersion times by decreasing the concentration or lowering the temperature.

Despite the wide variety of colors and shades available in commercial dyestuffs, occasions arise when a particular shade can be obtained only by mixing dyestuffs. It must be remembered, however, that dyestuffs have different rates of adsorption and a mixture that performs satisfactorily in the initial stages may produce different shades after continued use.

Different shades or tints may be obtained by using two or more immersions in different dyestuffs. When this is done, extreme care must be taken in control of such factors as rinsing between coloring steps, control of pH, time, temperature and concentration. Otherwise consistent shade match is not possible.

Rinsing after coloring with organic

dyestuffs is also important, since some dyestuffs may be leached from the anodic coating by prolonged exposure. Rinsing should be sufficient to remove the residual dyestuff solution in the shortest possible interval.

Coloring of anodic coatings may also be accomplished with non-aqueous solutions of dyestuffs. Certain dyestuffs may be dissolved in alcohol or hydrocarbons. These dyes are generally used for the selective applications of color to obtain multicolored effects. The techniques involved in the selective coloring of anodic coatings for multicolored surfaces are interesting and have been described elsewhere.

Commercial dyestuffs used for coloring anodic coatings actually are mixtures of dyestuff and other materials. The other materials may be added to produce a specific "coloring power," stabilize the pH of the dye solution or, in general, to improve the performance of the product under commercial operating conditions. For this reason, it is a hazardous practice to add wetting agents or other substances without consulting the manufacturers to determine if these additives are compatible with the dyestuff involved. The addition of phosphates is particularly harmful, since they decrease the adsorptive capacity of the anodic coating.

Anodic coatings also may be colored by a process known as "mineral pigmentation." This interesting technique involves the precipitation of an insoluble inorganic compound within the pores of the anodic coating. Coloring by the mineral pigmentation process generally involves two or more immersions under carefully controlled conditions

Colt revolver finished with Alumilite Black

of pH, temperature and concentration. The mechanism of the reaction is the adsorption of a water-soluble metal compound into the pores of the anodic coating. The anodized part is then immersed in another water-soluble compound having an anion that will combine with the metal of the first adsorbed compound to produce an insoluble, colored precipitate in the pores of the coating. Some of the more common inorganic compounds that are used for coloring anodic coatings are lead chromate for yellow, cobalt sulfide for black and lead sulfide for brown.

Other pigmentation procedures involve the precipitation of an insoluble compound within the pores of the anodic coating by hydrolysis of iron-containing solutions to produce insoluble compounds of iron. The resultant color is a yellowish gold shade or yellowish brown, depending upon conditions.

Sometimes it is necessary to remove the color from anodic coatings. This may be accomplished without difficulty by immersing the colored anodic coating in a concentrated solution of nitric acid at room tem-

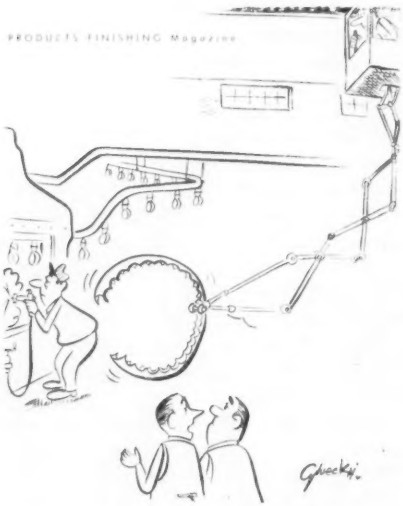
"Deionized water is recommended for commercial sealing processes . . ."

perature. The operation must be performed prior to sealing, otherwise complete removal of the color is difficult. Some dyestuffs do not respond to this treatment. Also, anodic coatings colored by mineral pigments will not always be decolorized by this technique.

Sealing Methods

Coloring of the anodic coating is made possible by the porous structure. Approximately five hundred billion pores per square inch of surface exist in anodic coatings formed in sulfuric acid under certain processing conditions.

After the anodic coating has been colored by the adsorption of organic dyestuff into the pores, the coating is still adsorbent. It must be sealed.



"When a man gets careless, we take him off the line—."

Unless the pores are closed, the anodic coating will continue to adsorb various substances and undesirable stains will result. Also, unless the pores are closed, the coatings will have lower resistance to corrosion. Another reason for sealing colored anodic coatings is the chemical reaction called "metallizing" that takes place between certain dyestuffs and the sealing solution.

Immersion of anodic coatings in boiling water is the most common method of sealing the pores. The generally accepted theory is that the anodic coating as formed is amorphous aluminum oxide and the exposure to boiling water converts the pore walls of the anodic coating to the mono-hydrate $Al_2O_3 \cdot H_2O$. The mono-hydrate has greater volume, therefore the hydration action closes the pores. For this reason, 150 deg. F. is generally the limiting temperature for coloring. If higher temperatures for coloring are used, coloring and sealing take place simultaneously.

Usually, anodic coatings which have been colored by organic dyestuffs are sealed in boiling cobalt or nickel acetate solutions rather than boiling water. Since these dyestuffs are soluble in water, leaching of the dyestuffs can occur during the immersion in the boiling water. There are, however, certain dyestuffs used to color anodic coatings which are not as sensitive to the boiling-water sealing treatment.

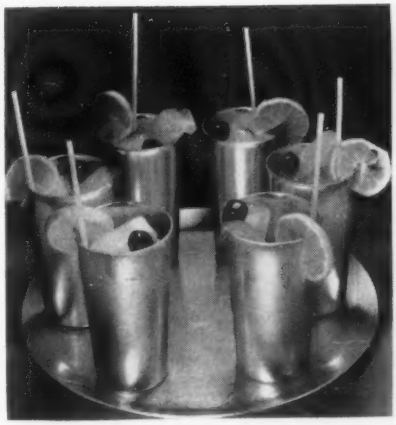
Deionized water is recommended for commercial sealing processes because certain anions or cations ad-

versely affect the sealing process. Temperatures of 208-212 deg. F. and a pH of 5.5-6.5 are generally used. High pH will result in an objectionable residual film called "sealing smudge," whereas at a lower pH the anodic coating will not be completely sealed.

Most colored anodic coatings are sealed in boiling solutions of nickel or cobalt acetate. The boiling solutions of these compounds hydrolyze to form colloidal hydroxides of nickel or cobalt, which deposit in the pores of the anodic coatings. This action closes the pores. It follows, of course, that concentration and pH must be controlled for most effective results. A pH of 5.0-6.0 is generally used. A residual film is deposited upon the surface during the sealing treatment. The luster or gloss may be restored if the anodic coatings are color-buffed or rubbed with an abrasive wax cleaner.

During the exposure to the boiling nickel or cobalt solutions, which are generally acetates, some dyestuffs are "metallized." Sometimes an actual change in shade is apparent. Anodic coatings colored with certain organic dyestuffs will exhibit greater lightfastness characteristics after sealing in boiling nickel or cobalt acetate solutions. The dyestuff molecule "metallizes" by combination with the nickel or cobalt, forming a more stable compound. Sometimes commercial sealing practices for colored anodic coatings utilize both boiling nickel or cobalt acetate and boiling water.

The dyestuff is exposed only a very short time in the acetate solution—perhaps one minute instead of the conventional 5 to 10 minutes—to "fix" it in the coating. Then the sealing treatment is continued in boiling water to completely seal the coating. Although the process involves additional steps, it has the advantage of less "sealing smudge" being formed on the coating.



Kensington, Inc. aluminum giftware with buffed Alumilite finish. (Photo courtesy Aluminum Company of America, Pittsburgh.)

The use of certain wetting agents also helps to minimize "sealing smudge," is usually desirable.

Higher resistance to corrosion, particularly salt-spray corrosion, can be imparted to the colored anodic coating by immersion in boiling dichromate solutions after sealing in nickel or cobalt acetate. Sometimes the dichromate may be incorporated into the nickel or cobalt acetate sealing solutions. Since some dyestuffs are sensitive to the oxidizing conditions of hot dichromate solutions, care must be taken in the selection of the dyestuff.

Anodic coatings colored by the pigmentation process are generally sealed in boiling water. Since the

precipitated pigment is insoluble, little or no leaching of the color will take place.

The coloring of anodic coatings is an interesting and sometimes complex process. Colored coatings have many important commercial applications in the production of appliance and automotive trim, instruments, emblems, identification plates and many other items. It is hoped that this discussion will result in a better understanding and appreciation of all factors involved in the successful production of colored anodic coatings.

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Paint Stripping Technology Today

Removing paint becomes more difficult as paints improve . . . here's what materials available now will do . . . what to expect from strippers now in the development stage . . .

By L. J. DURNEY
Enthone, Inc.
New Haven, Conn.

Paint strippers can be classified into five groups:

1. Alkaline type.
2. Acid type.
3. Solvent type.
4. Cold strippers (chlorinated type).
5. Hot-solvent-emulsion strippers.

Alkaline Type

The alkaline stripper is probably the oldest type of stripper known. It has undoubtedly undergone more variation and development than most other types.

The simplest form of alkaline stripper consists of hot alkaline solutions made from caustic soda, caustic potash and mixtures of these with soda ash and other alkalies. Its action is dependent on the ability of the stripper to saponify the fatty acid portion of the vehicle — as with alkyds and oil-type paints; or to break ester linkages—as with cellulose nitrate.

Alkaline strippers remove phenolics, oil paints, gum varnishes, cellulose acetate and cellulose nitrate. Simple alkaline strippers do not affect the pigment, however, and a final adherent residue of pigment is frequently left on the work, requiring wiping or brushing prior to refinishing.

Wetting agents greatly improve the action and speed of alkaline strippers by permitting more rapid penetration of the paint film.

Certain solvents can be incorporated in alkaline strippers and caused

"This additive may reduce the number of strippers to a relatively few concentrates and blended alkalies . . ."

to react with the alkalies to become soluble. These solvents swell the resin in the film. The resulting disruption of the film vastly increases the speed of the stripping action. Solvents extend the effectiveness of these strippers to cover certain melamines, acrylics and vinyls.

The action of these solvents is greatly improved after reaction with the alkali. Since this reaction takes time, it's advantageous to prepare the stripper and age it for periods up to six months prior to use. While certain techniques of mixing and blending reduce or eliminate this aging period, these techniques are not adaptable to use in the average consumer's plant. Therefore, completely prepared materials are shipped to the consumer. Solvents and alkalies used in these strippers are frequently specific for certain paints.

While the solvent-alkali blends broaden the usefulness of these products, the problem of residual pigment is not solved by blending. But certain deflocculating agents and complexing agents for the base metal can be added to break the adhesion of the residual pigment and permit it to be flushed off in the water rinse. The deflocculants and chelating agents also show some specificity, thus making an even greater number of strippers necessary.

A concentrate of the modifying ingredients necessary to break adhesion of residual pigment can be added by the consumer to solutions of alkali prepared in his plant.

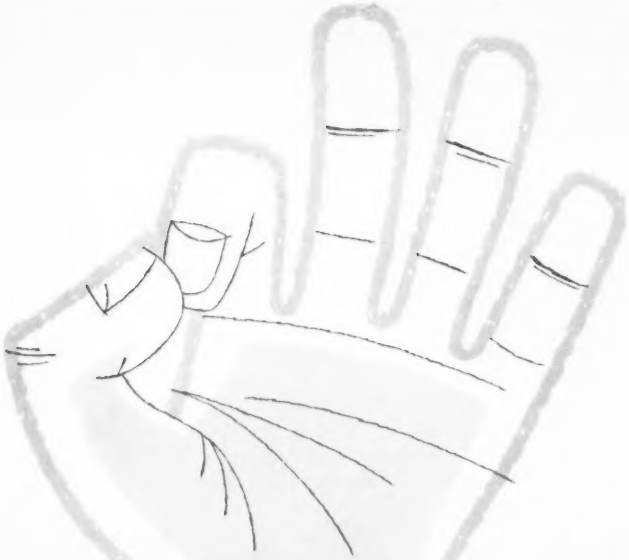
This additive concentrate promises to alleviate the problem of large-volume shipments, and it may reduce the present large number of strippers to a relatively few concentrates and blended alkalies which could be combined in various ways.

Acid Strippers

Acid strippers are nearly as old as the alkaline type. Concentrated sulfuric acid, nitric acid and chromic acid (or mixtures thereof) have been used for many years. Their stripping action is through chemical destruction by oxidation or dehydration of the vehicle, and occasionally of the pigment. The drawbacks here are that these materials are extremely corrosive and hazardous; and it is difficult to prevent attack of the basis metal. They are used only in a few specific cases; generally, other types are used instead.

Recent developments, however, indicate that this type of stripper may become more useful. Certain solvents react and/or combine with acids to produce homogeneous solutions with excellent stripping abilities. These mixtures are less hazardous to work with, and in many cases may be inhibited to prevent action on the basis metal.

In the solvent-acid strippers the action of the acid is not oxidation or dehydration of the vehicle, but a hydrolysis of the resin, or a destruction of the polymerizing linkage. This permits the solvent to exert a swelling and gelling action on the degraded polymer, with resulting detachment of the coating. At the same time, the acid frequently makes the pigment more soluble, opening the coating still further. Its effect on the



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oxides normally present on the surface of the metal effectively destroys the mechanical bond of the coating to the surface. This development is still in its early stages, but it is probable that solvent-acid strippers will be forthcoming.

Solvent Strippers

Solvent-type strippers depend completely on the solubilizing action of the solvent on the paint film. Their disadvantages: relatively high evaporation rates; fire hazards; cost; rapid saturation with dissolved paint; residual film remains on the parts after evaporation. Some improvement has been made by incorporating emulsifying agents to permit the stripper to be rinsed from the surface, thereby eliminating the problem of residual films.

This type of stripper is preferred for work of high complexity, such as wire goods, where the other strippers may not remove the detached paint films from crevices, joints and seams.

"You wanted me to keep track of my rejects, didn't you?"

Cold Strippers

Cold strippers are the outgrowth of the discovery that methylene chloride and other chlorinated solvents have remarkable stripping power. These materials work best where they are not true solvents for the resin, but are absorbed only enough to cause swelling of the film. This swelling increases the volume of the paint several times. It occurs in all directions.

The result is a large increase in area. The stress produced by this expansion can be relieved only by buckling, blistering or otherwise releasing the paint film from the base metal which defines its original area. It is this force which causes the paint to lift. If the paint film is continuous, and the strength of the gelled film is sufficiently greater than the paint-to-metal bond, the film will release in a single continuous film. But if the film strength is low, the film porous, or the bond strength high, the film will tend to flake or scale off and trouble will be encountered with residual specks of undetached paint. Overspray specks are usually extremely difficult to remove, since the film is sufficiently discontinuous to permit the resin to swell without developing any appreciable stress.

Because this mechanism of stripping relies on the intrinsic strength of the gelled film, the stripper with the most powerful solvent action is not always the most effective stripper.

The action of the chlorinated solvent is frequently enhanced by the addition of acids, soluble alkalies and amines. Special solvents affect the paint film and permit a more rapid swelling. Or they may react with the

"In some installations the lack of ventilation and/or heating facilities will dictate use of cold strippers, despite economic factors."

basis metal at the surface to break the bond by dissolving surface oxides.

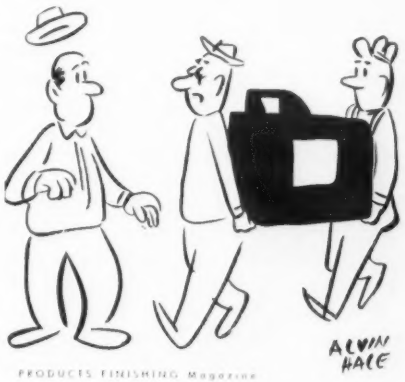
While it is possible to reduce evaporation losses by covering the surface of the stripper with a layer of water, rate of evaporation is relatively high. This raises the cost of operating solvent-type strippers. Where the operation is such that stripping can be carried out in a small setup, this cost is offset by the convenience of operation. In large installations, however, the cost of replacing evaporation losses is prohibitive. In some installations the lack of ventilation and/or heating facilities will dictate use of cold strippers, despite economic factors.

Hot-Solvent Emulsion Strippers

The hot-solvent emulsion strippers consist of various solvents (usually cresylic acids, phenols, high-boiling chlorinated materials or aromatics) dispersed in aqueous media. The most stable and the most effective strippers of this type approach colloidal dispersions. Relatively coarse emulsions which visibly "cream," or show opalescence, do not, as a general rule, perform as well as the clear dispersions.

The mechanism of stripping is essentially the same as with the cold strippers. However, absorption of solvent takes place now from a diluted emulsion of the solvent, rather than from pure solvent. It is important in formulating materials of this type to preserve the normal hydrophobic condition of the paint surface. The addition of any material which will reduce the interfacial tension between the paint film and the external water phase of the emulsion may reduce the stripper's effectiveness. The interfacial tension between the paint film and the internal solvent phase of the emulsion must be lower; otherwise, preferential adsorption of a water film on the paint surface and failure to strip result.

The active solvent phase of these systems may constitute as little as 10 to 40 per cent of the working solution, depending on the degree of dilution employed. Because of the adsorption mechanism however, essentially 100 per cent solvent mixture is available at the paint interface. Higher dilutions will increase the stripping time, of course, since replenishment of the adsorbed solvent film as it penetrates the paint film will take longer. Too great a dilution may inhibit stripping completely if the solvent phase is reduced to a point where it can no longer com-



"This is the finish the new paint stripper removed—we can't find the cabinet."

pletely blanket the surface to be stripped.

Since emulsions of this type are most readily prepared using soaps, these strippers are essentially limited to the alkaline type. As a result they are generally ineffective on the acid-susceptible resins, such as certain epoxy types. Most other resins can be successfully stripped by one or more of the various modifications possible with this system.

New Stripper Types

Two new types of strippers have been introduced recently. While it is possible that these may be classed in one of the types already listed, there are indications that they may form the basis for two entirely new classifications.

The first of these employs the classical phenolic-solvent-type composition in a clear, dispersion-type emulsion. It differs from the classical hot-emulsion type, however, in being distinctly acid. This acidic stripper will remove most of the resins that can be removed by alkaline hot-emulsion strippers. In addition it is effective on all acid-susceptible resins, including many epoxies. Further, the acid present dissolves surface oxides from the metal, resulting in faster release of the paint film.

In function and basic composition, the second new type is similar to cold strippers. It has the advantage, however, of being dilutable with water to a rather extensive degree. As a result of this dilution, evaporation losses are reduced and initial charging costs are markedly less. In some instances, increased stripping activity is brought about by the activity of acidic or alkaline components being increased in the presence of the water used for dilution. Within certain dilution limits clear dispersions are produced. Therefore, the solutions are extremely stable.

Future Developments

As paint manufacturers continue to develop resin formulations with improved resistance characteristics, the problem of providing suitable paint strippers becomes increasingly difficult. Factors of economy, toxicity restrictions, speed of stripping and the diversity of resin combinations are dictating strippers with a high degree of specificity. It is assumed that this condition will continue until some new and unusual materials appear and make possible the development of economical, universal-type strippers.

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Booklet on Nickel Plating. "Practical Answers to 40 Practical Questions About Nickel Plating," a 24-page booklet, is designed to answer, in a non-technical way, those questions which are most frequently asked of plating specialists. As such, it deals directly with problems of interest to platers, engineers, and equipment designers.

The questions and answers included in the booklet pertain to all phases of plating. Some deal with the physical and chemical properties of the coating itself, and with its machining, welding and forming possibilities. Plating techniques and various design factors important to quality plating are also discussed, as well as the many applications for nickel coatings.

"Practical Answers to 40 Practical Questions About Nickel Plating" is available without charge through the Readers Service Section of The International Nickel Company, Inc., 67 Wall Street, New York 5, N. Y.

Toolmaker uses . . .

Nickel Bath with Good Tolerance for Impurities

This bright nickel runs continuously for long periods without being adversely affected by organic and inorganic impurities . . .

New Britain Machine Company's hand tool division recently began plating from a bright nickel bath that has outstanding tolerance for organic and inorganic contaminants. This bath has now operated continuously for six months without shut-down for solution treatment and tank cleaning. Only normal additions have been made to replace chemicals consumed or lost by dragout.

The Connecticut toolmaker's new bath is a product of Federated Metals Div., American Smelting and Refining Company. New Britain Machine was the first company in the eastern United States to install the new process, which is called "Levelmax."

This bath deposits the bright nickel plate portion of the composite copper-nickel-chrome coating that protects the company's hand tools. To withstand the abuse that most tools must take in service, this coating must be unusually durable.

Let's examine the manufacturing process at New Britain Machine Company to see how the new bright nickel process fits into the rest of the fabricating and finishing procedures.

The typical hand tool is forged, annealed, ground, heat treated, and polished before it is ready to be plated.

In the plating room, tools hung on plastisol-coated racks fitted with titanium tips are cleaned in a separate alkaline spray washer before they travel through the sixteen-stage process carried out in a Hanson-Van Winkle-Munning automatic plating machine (Fig. 1). Stages in this machine are as follows:

1. Cold rinse.
2. Cathodic clean.
3. Cold rinse.
4. Acid pickle.
5. Cold rinse.
6. Cold rinse.
7. Cyanide copper strike.
8. Cold rinse.
9. Sulfuric acid rinse.
10. Cold rinse.
11. Bright nickel plate.
12. Dragout rinse.
13. Cold rinse.
14. Chromium plate.
15. Warm rinse.
16. Hot rinse.

Following the last rinse, racks are removed from the automatic plating machine and sent through a dryer. The finished tools are then ready for packing and shipment to dealers.

Properties of the Levelmax bright nickel bath (step 11 in this plating procedure) are the result of three additives used: SN 35, the primary brightener; SN 25, the wetting agent and anti-pitter; and SN 15, the secondary brightener.

The secondary brightener is consumed in the plating process and has to be replaced at regular intervals. Other additives are depleted only through dragout and, provided this is kept to a minimum, need replacement only infrequently. The secondary brightener is replaced daily, while others are added in small quantities from time to time to adjust concentration.

Composition of the Levelmax bath used at New Britain Machine Company is shown in Table I.

Levelmax brighteners SN 15 and SN 35 come as concentrates. They are diluted (1 part additive to 3 parts water) before addition to the plating bath.

SN 35 raises the pH of the bath, so that sulfuric acid must be added after the brightener is added to readjust pH to the optimum value.

Current density of the bath is held at 40-80 a.s.f., although the solution will tolerate currents up to 110 a.s.f. without "burning" the deposit. Temperature is held at 140 deg. F. automatically. Clarity of the solution is maintained by continuous filtration through an Industrial filter.

A dragout tank (step 12) immediately following the 2500-gallon nickel plating bath rinses off most of the nickel plating solution from parts coming out of the nickel tank.

Fig. 1—View of Hanson-Van Winkle-Munning automatic plating machine. The section of the tank shown at left is the 1500-gallon cyanide copper strike solution. Section at right is the 2500-gallon bright nickel plating solution. Exhaust stacks in left foreground remove fumes from cyanide copper tank section. (Photo courtesy New Britain Machine Co. and Federated Metals Div., American Smelting and Refining Co., New York, N. Y.)

Table I

COMPOSITION OF LEVELMAX NICKEL BATH

	Maintained Concentration	Recommended Range
Nickel Sulfate	42.1 oz./gal.	38-42 oz./gal.
Nickel chloride	10.3 oz./gal.	8-15 oz./gal.
Boric acid	6.3 oz./gal.	6-8 oz./gal.
pH	3.0	
Levelmax Brighteners:		
SN 15	5.5 pints (diluted)	6 pints/1000 gal. (added twice per 8 hours of operation; 1 pint per 4000 ampere-hours of operation)
SN 25	8 pints	6-8 pints/1000 gal.
SN 35	39 gal.	36-40 gal./1000 gal. (diluted)

Concentration of the nickel solution in this tank is allowed to build up until draining becomes necessary. Then this solution is pumped into the nickel plating tank. Level of the nickel solution is maintained automatically by a controller on the nickel tank and the dragout tank. Water is added to the dragout tank automatically after dragout is pumped into nickel tank. The "dragout solution" replaces nickel sulfate and additives that have been taken from the nickel plating bath in the solution remaining on plated parts when they leave the nickel tank.

Nickel sulfate is the principal source of nickel in the solution. Concentration of this component is checked every two weeks and additions made to keep the concentration between 38 and 42 oz./gal.

New Britain Machine has checked for thickness in various areas of the tools being plated and has found that the difference between high and low current density areas (those facing towards and those facing away from the anodes) is as little as 20 per cent. The good throwing power of this bath makes possible the deposition of nickel in blind holes and recesses.

Levelmax produces a deposit with excellent brightness, the company has found. Leveling properties of the bath make it possible to fill in small scratches in the tools.

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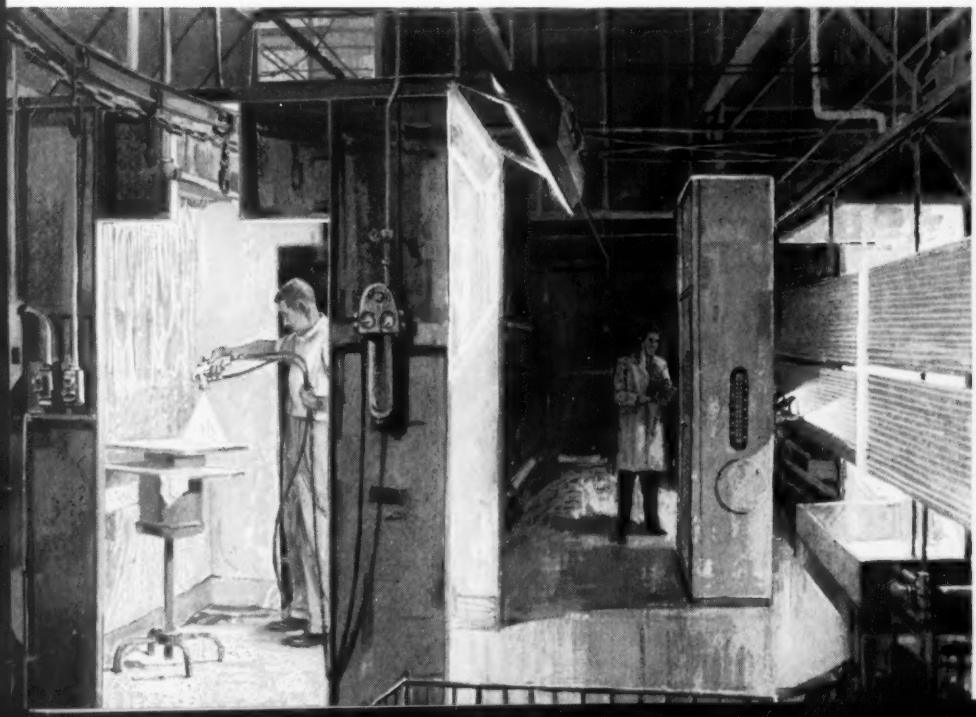

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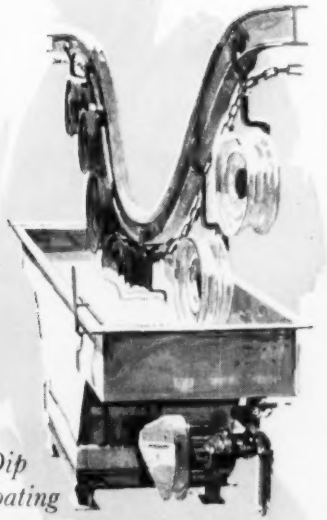

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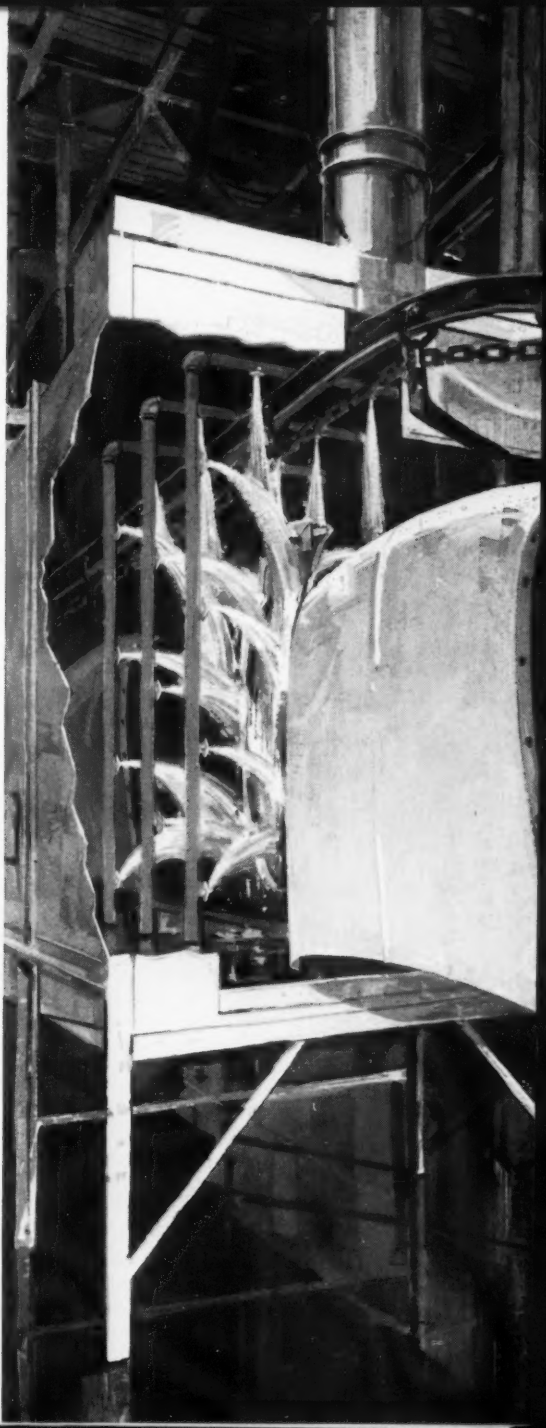

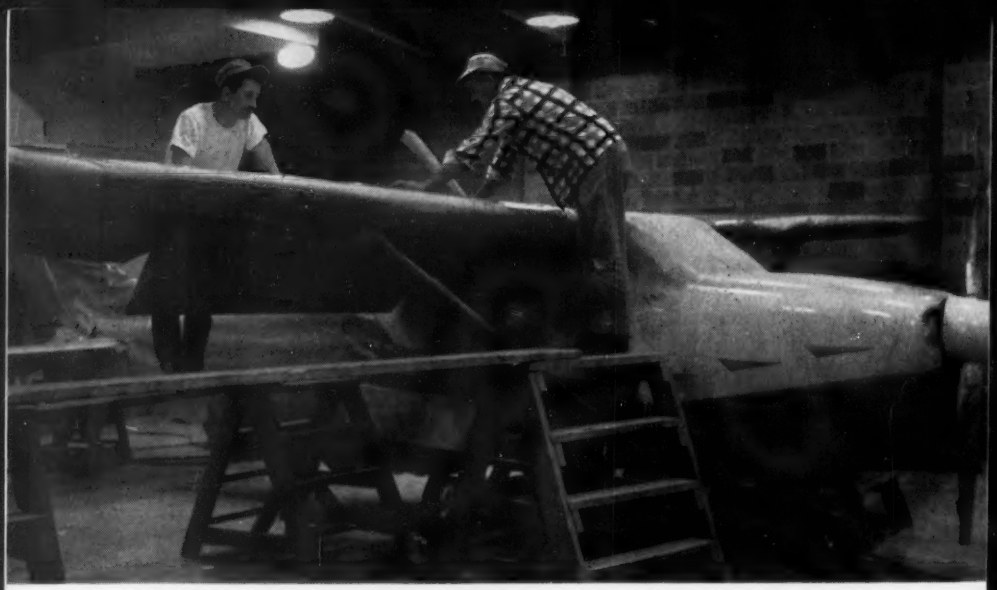

Painting Assembled Aircraft

Cessna applies a specially formulated vinyl finish in an installation engineered to paint an airplane that's ready to fly . . .

By **OGLE FRENCH**
Processing and Painting Foreman
Cessna Aircraft Company
Wichita, Kansas

Painting small aircraft after assembly presents some problems that most finishers don't normally encounter. Most of the airplane finisher's headaches are caused by the size of his job. When you paint something this big on a production basis you have to have an airplane-sized spray booth and a large drying area. The space required causes problems in exhausting air from the spray booth and in controlling temperature of the drying room.

The Commercial Aircraft Division of Cessna Aircraft Co., Wichita, Kansas, has an efficient system that turns out quality work.

Painting Procedure

Cessna aircraft coming off the

Fig. 1—A Cessna Model 210 is masked-off before being painted with a special vinyl finish. The 210 is one of four models built by Cessna that receive overall paint finishes.

assembly lines move to a specially equipped finishing building. They leave this building with a vinyl finish and/or decorative stripes.

Solvent cleaning removes grease and dirt before paint is applied. Windows and other areas are masked off before the airplane moves into a spray room—really an oversize spray booth—that is large enough to accommodate one airplane at a time. Filtered, warm air enters one side of the booth, is exhausted through a water curtain on the other side. Since the operator knows which direction the air is flowing, he can work so that the overspray is always carried away from the areas already painted.

Some Cessnas are completely painted, while others receive stripes and decorations only. Models that are painted all over are sprayed with a special white vinyl finish, a product of Enmar, Inc.

The painted planes dry in a room that is kept at 130 deg. F. This room is large enough to hold six or seven aircraft at one time. Drying takes four hours.

Temperature of the drying area must be controlled closely. Overheating would damage the vinyl coating and might also harm certain parts of the airplane. Under proper conditions, the vinyl coating dries to a hard, glossy finish that has excellent appearance and durability.

Models that receive a second coat are masked and taken back to the spray area. Two additional colors are applied before the plane comes back to the drying room.

Some models go directly to the

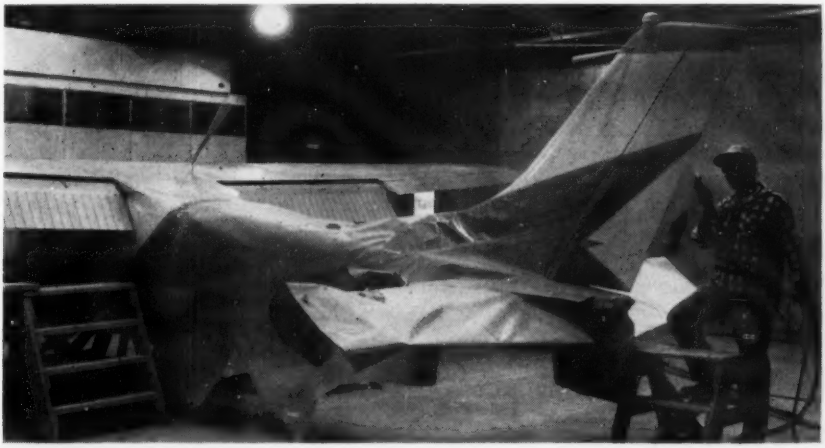

Fig. 2—A Cessna Model 210 receives a coat of vinyl in one of the paint booths. The 210 is available in eight three-color combinations. After an overall coat of white is applied and dried, plane is masked again, two additional colors are sprayed on and heat dried to form the three-color combination. Vinyl coating used has excellent durability.

Fig. 3—Cessna controlled temperature room where aircraft are heat dried at 130 degrees F. for four hours after receiving vinyl paint finishes. Heated air enters at one side of the room, flows across and is removed for recirculation at the other side of the specially constructed room. (Photographs courtesy Cessna Aircraft Company, Wichita, Kansas.)

striping room after the first coat for application of stripes in various colors. The stripes air dry.

Models that are not painted all over are primed beneath the decorative stripes only.

★ ★ ★ ★ ★

Guidebook on the Application of Porcelain Enamels to Aluminum. The 22-page book covers alloy selection, metal preparation, choice of frit, slip formulation, enamel application and firing.

In addition, the book compares the advantages of porcelain enameled aluminum to those of porcelain enameled steel.

The book, "Porcelain Enameling of Aluminum," is available on letterhead request from Reynolds Metal Company, Dept. PRD-27, Richmond 18, Virginia.

★ ★ ★

Tape-Test Methods. The Pressure Sensitive Tape Council has adopted two new test methods to include in its comprehensive "Test Methods for Pressure Sensitive Tape Products."

The new test procedures cover some of the electrical properties of pressure sensitive tapes.

The two tests have just been added to the jacket of pressure sensitive tape tests. Companies desiring complete test jackets may obtain them by writing to the Pressure Sensitive Tape Council, 1201 Waukegan Rd., Glenview, Ill. Price, $1.00.

Other test procedures included in the Tape Council jacket are as follows: Peel Adhesion; Shear Adhesion; Unwind Adhesion; Tensile Strength; Thickness (caliper); Elongation; Moisture Vapor Transmission; Water Penetration; Resistance to High Temperature and Humidity; Resistance to High Humidity at Room Temperature; Quick Stick; Stain Test for Finishing; and Cold Temperature Performance.

The "Test Methods" also include a glossary of terms used in the Pressure Sensitive Tape industry.

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Case histories show . . .

What Precision Barrel Finishing Can Do

By J. J. FORRESTER, JR.
Assistant to the General Manager
Electro Minerals Division
The Carborundum Company
Niagara Falls, New York

Fifty years ago "tumbling" as a finishing operation on small metal parts was generally restricted to such items as belt buckles, phonograph needles, drawer pulls and simple metallic hardware parts. The operation was simple, with little technical control of the tumbling media used, the compounds, or the operating techniques. The media used was sand or natural stones such as trap rock, limestone or granite; the compounds were oil or water, or sometimes it was a dry operation; the barrels were frequently unlined or wood lined.

In recent years, however, processors of precision parts have been besieged by their customers to supply better finishes, more precise dimensions and closer tolerances.

Heretofore the established method of finishing metal parts where good finishes were required was to treat the parts individually, using coated abrasives, grinding wheels or files. In most instances the operations were done by hand—obviously an expensive procedure. To improve finish and tolerances by such techniques would involve additional steps in the cycle, and this would not be economically feasible.

To improve finishes economically, engineers began to investigate the tumbling process as a method for deburring, descaling, generating radii and developing better finishes on the complex and often delicate parts demanded by modern day industry.

The equipment manufacturers were asked to provide improved barrels, and the compound manufacturers were called upon to develop better compounds.

The abrasive manufacturers were asked to provide media especially designed for specific applications.

Special products of the electric furnace now provide the crude material for tumbling nuggets and tumbling grains, used where rapid cut is desirable. The grains are also incorporated in ceramic-bonded pellets for use where lodging might be a prob-

Improved methods and materials combine to make barrel finishing a scientifically controlled, cost-cutting method . . .

lem and in rubber-bonded pellets for use in finishing soft metal parts and delicate parts.

A special electric furnace product provides the crude material for a medium especially designed for burnishing operations and the development of high color.

In addition to providing the raw materials for good tumbling media a great deal of attention has been paid to the processing of these materials. Formerly, the user of tumbling media found it necessary to "pre-condition" the media before he could use it. This was a time-consuming operation and resulted in considerable loss of valuable material.

The abrasive manufacturer now includes in his processing of tumbling media extra steps to provide thoroughly pre-conditioned materials accurately graded to close sizing specifications. Thus the barrel finisher now receives a product that's ready for use.

Many abrasive manufacturers, as well as equipment and compound manufacturers, have established service laboratories where they can study special problems and make recommendations as to barrel conditions, media, compounds and operat-

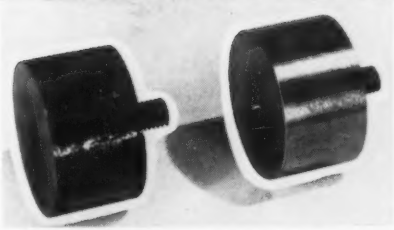

Fig. 1—Formerly paint was removed from and corners broken on these pilot mandrels by hand filing. Tumbling in 5/8-inch pellets for two hours and in No. 4 1/2 "Carbo-Brite" for one hour, using a neutral cleaner produced the smooth product shown at right.

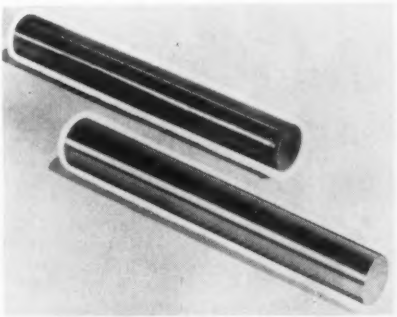

Fig. 2—Rounding the corners and producing a high finish on steel centering pins was formerly done by hand filing the corners and polishing with coated abrasives. The job is now done quickly and effectively by tumbling one hour with No. 4 1/2 Nuggets and then for one hour with No. 4 1/2 "Carbo-Brite."

". . . the inexact tumbling process of 50 years ago has developed into a precision method."

ing conditions required for a specific product.

The random and relatively uncontrolled tumbling operations of a few years ago have progressed to the point where they are now technically controlled. What we formerly referred to as "tumbling" we now prefer to designate as "precision barrel finishing."

The accompanying photographs show some of the precision work now being done by barrel finishing.

In the case histories illustrated by the accompanying photographs a cost savings of a few cents per piece has resulted. A few cents may appear to be insignificant, but when we consider that hundreds of thousands of these parts are processed each year, a cost reduction of only one cent per piece can be substantial.

Thus it can be seen that the inexact tumbling process of 50 years ago has developed into a precision method that is making significant contributions by producing products with better finishes and closer tolerances than we have ever known—and at a lower cost.

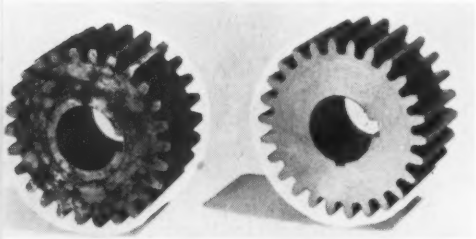

Fig. 3—To remove the burrs from a machine gear by hand filing required 10 minutes per gear. The job is now done by tumbling with 3/8-inch cylindrical pellets for two hours.

Fig. 4—Removal of heat treat scale from hydraulic press shims by hand filing and polishing with coated abrasives required two minutes for each shim. Tumbling with 5/8-inch triangular pellets for two hours using a mild acid cleaner for one hour and a neutral cleaner for one hour followed by tumbling with No. 4 1/2 "Carbo-Brite" with a neutral cleaner for one hour improved the product.

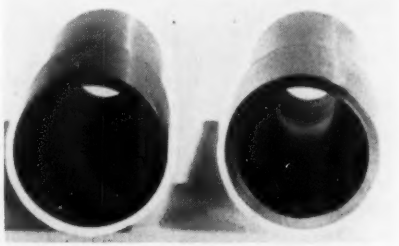

Fig. 5—To improve the finish on the I.D. of heat-treated extrusion dies and break the corners formerly required mounting the part on a lathe and cleaning by hand, using coated abrasives. The job is now done by tumbling for one hour in 3/8-inch pellets and one hour in No. 4 1/2 "Carbo-Brite," using a neutral cleaner. (Photographs courtesy the Carborundum Company, Niagara Falls, N. Y.)

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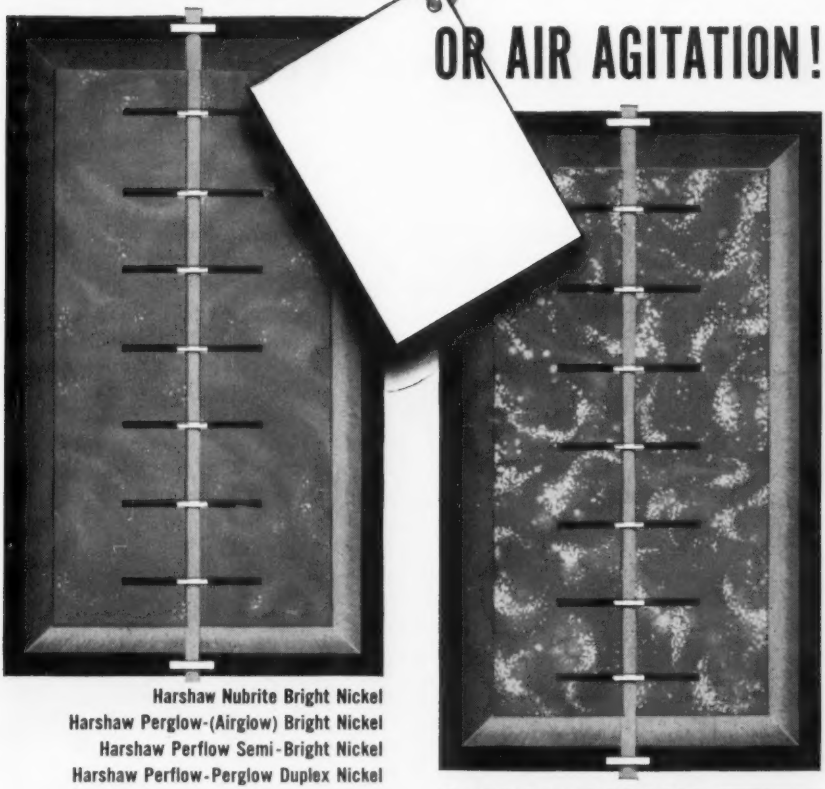

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Traveling-Booth Paint Shop at Bell Helicopter Cuts Painting Time

A traveling spray booth recently installed at Bell Helicopter Corporation, Fort Worth, Texas, enables the company to cut the time required for painting helicopters substantially.

Manufactured by Binks Manufacturing Company, Chicago, the facility is an excellent example of how spray painting of complex items can be done on a production-line basis. This has been a trend in finishing during the past few years.

Working with Bell engineers, Binks devised a system custom fitted to the helicopter manufacturer's needs. The approach that engineers from both companies took seems at first sight backward; however, it actually worked out to be the most logical method. Instead of constructing a building and then equipping it with painting booths and equipment, the painting facility and needed equipment were specified first.

"Our new building," said William Kissel, supervisor of equipment procurement, "was actually designed around the new facility. Because we're painting a complex piece of equipment, it's virtually impossible to run it down a production line in the usual manner. Our job was to figure how to hand spray these helicopters and get production-line results.

In addition to painting a complex item on a high-speed basis, Bell was faced with other problems. For instance, the painting facility had to be easily convertible from enamel to lacquer or zinc chromate primer. Add to this the need for making quick color changes, since any given helicopter might require two or three different colors.

Bell's production schedules called for painting more than one helicopter at one time. At the same time, space had to be provided for the preparation of additional helicopters for painting. Also needed was a provision for protecting newly painted surfaces.

Solution to all these problems was the installation of two painting lines (Fig. 1) in the new building, each served by a large traveling paint booth. Four helicopters can be placed on each line. The booths, mounted on steel rails imbedded in the floor, straddle the ships as they move down the line. Between the lines, six helicopters can be prepared and masked for painting.

The booths are installed in a new 46,549 square-foot wing that has been added to the main plant. Of this, the paint shop occupies 17,500 square feet, and the remaining area is occupied by production control, parts assembly, sheet metal sub-assembly, mechanical lab, tool cribs and offices. Total cost of the new wing and equipment was $641,000.

Protection of newly painted surfaces was provided for by the construction of an air-lock room. This room can be completely closed off while the painted helicopter is being cleaned up.

Metal surfaces that are to be painted are conditioned before assembly. Aluminum parts are conversion coated, magnesium parts are treated with a chemical etch solution to improve paint adhesion. Both operations involve a dip process. These detail parts are then routed to the assembly line, and are ready for application of the primer and final coats after the aircraft is assembled.

Application of one type paint or

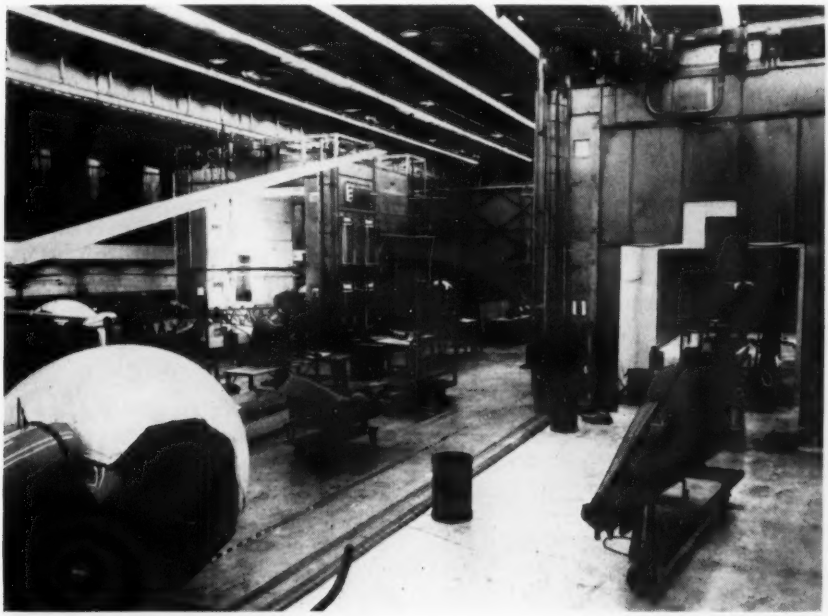

Fig. 1—Overall view shows layout of painting shop at Bell Helicopter. Two traveling booths are left and right, and ships between the lines are being prepared for painting.

"Adjustable work platforms can be positioned to allow the painter to reach the top of the helicopter as easily as the sides."

primer is done on all four ships in one pass of the booth. First of all, the ships are given coatings of zinc chromate primer. The first helicopter is primed, and then the booth is put into motion and moves to the next helicopter on the painting line. This one is then primed, and so on down the line until all four are done. The booths actually straddle the helicopters (Fig. 2), and are moved by large electric motors.

The next step is application of either an enamel or lacquer color coat or an epoxy-base finish. This is done in the same manner.

Where more than one color is used, one color will be applied in each pass.

Color changes in the booth itself are made merely by turning off the material supply valve on one paint container, irrigating the spray gun to clear it out, and cutting in the next paint container. All paint finishes used are of the air-dry type.

The booths themselves are designed to permit painters to work with a minimum of time-wasting and fatiguing climbing. Adjustable work platforms (Fig. 3) can be positioned to allow the painter to reach the top of the helicopters as easily as the sides. These adjustable platforms also aid the sprayer in holding the gun at the correct angle with respect to the surface without undue stretching or bending.

Since they are movable, the booths are equipped with all the components necessary for a complete painting system. Binks spray guns, oil and water extractors, and siphon cups are used. Material containers are mounted on a platform on the outside of the booth, and hoses feed through holes in the walls of the booths.

An electric motor-driven compressor is provided for each booth, together with an air pressure tank. The compressors keep the tanks supplied with air at 90 p.s.i.

Exhausting of paint fumes and overspray presented a problem. Since the booths are mobile, they obviously could not utilize a conventional in-place exhaust system. At the same time, paint fumes and overspray could not simply be exhausted outside the booths, since personnel are constantly at work in the shop.

The problem was solved by equipping each of the booths with two Binks water wash filtering systems, one on each side of the booth. These units are exhausted outside the building by means of louvered ducts in the ceiling.

Each water wash system is equipped with an exhaust fan which draws fumes and overspray directly through the water. Suspended paint particles are scrubbed out as they pass through the curtain of water. The direction of air flow is then changed suddenly through the use of baffles, and centrifugal force throws out the remaining paint particles, which are washed down the sides of the system by water to a collecting pan below. Air is then exhausted outdoors, making the shop a safe place in which to work.

Experience has shown that in addition to saving time, the installation produces a higher-quality finish.

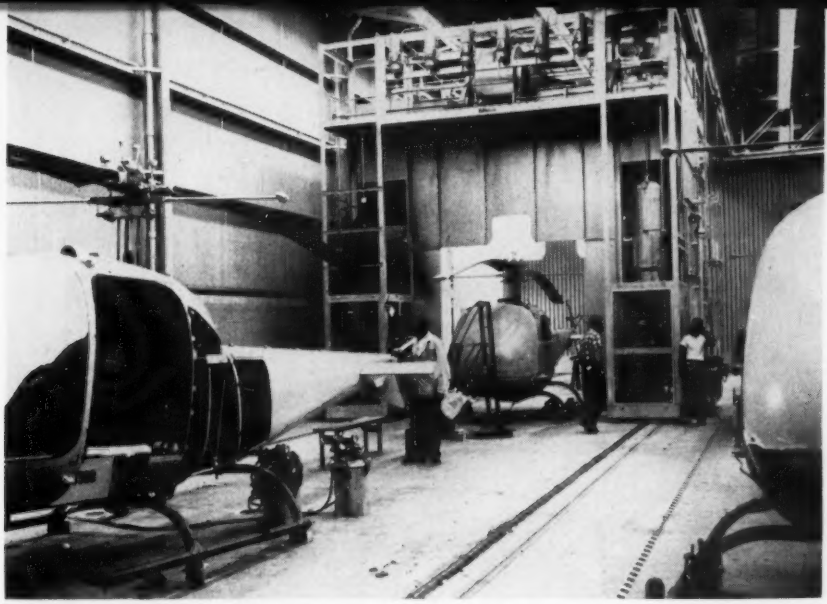

Fig. 2—Two helicopters (left and in booth) of the four that can be put on the painting line at one time. Four more are on the other painting line on the other side of the shop. Helicopter in right foreground is on the masking line between the two booths. Note material containers on outside platform of paint booth, and air pressure tank mounted on right front of booth. Compressor is positioned below the compressed air storage tank. Part of self-contained exhaust system can be seen on top of the travelling spray booth.

Fig. 3—Adjustable work platform in traveling booth makes painting easier. Painter does not have to climb a ladder and he can keep the spray gun at correct angle.

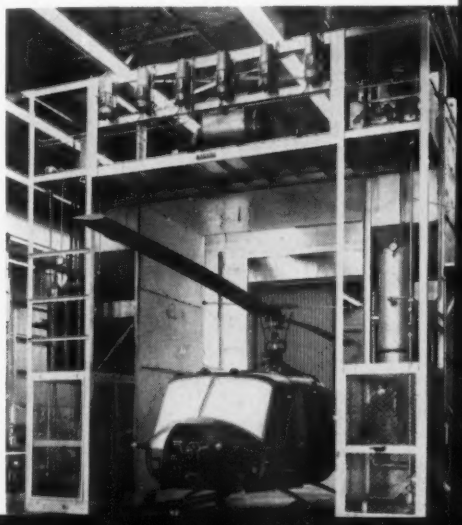

Fig. 4—Bell's latest helicopter model is the HU-1A. Jet powered, it is designed for use by the Army as a front line utility helicopter. (Photos courtesy Binks Mfg. Co., Chicago.)

Aluminum Bus Bar Cuts Cost for Anodizer

Important cost savings resulted when cast aluminum bus bar recently was installed at Aluminum Extrusion Company's Los Angeles plant.

The lightweight bus, cast by Kaiser Aluminum & Chemical Corporation, is used to feed a 7500-ampere anodizing tank. It marks one of the first applications of this type for the new cast bus product.

The bus was designed to carry a capacity of 840 amperes per square inch. Use of aluminum resulted not only in substantial cost savings on the material but also in reduced installation time, according to Larsen-Hogue Electric Construction Company, Los Angeles, contractor on the job.

Connections to the rectifier and tank were made by silver plating the bus bar ends and bolting the joints. All splices and right angle joints were made by the Cadweld process, and no unusual problems were encountered.

Bus size on the job was $\frac{3}{8}$ by 6 inches by 20 feet. One workman could handle the individual pieces, which weighed approximately 40 pounds.

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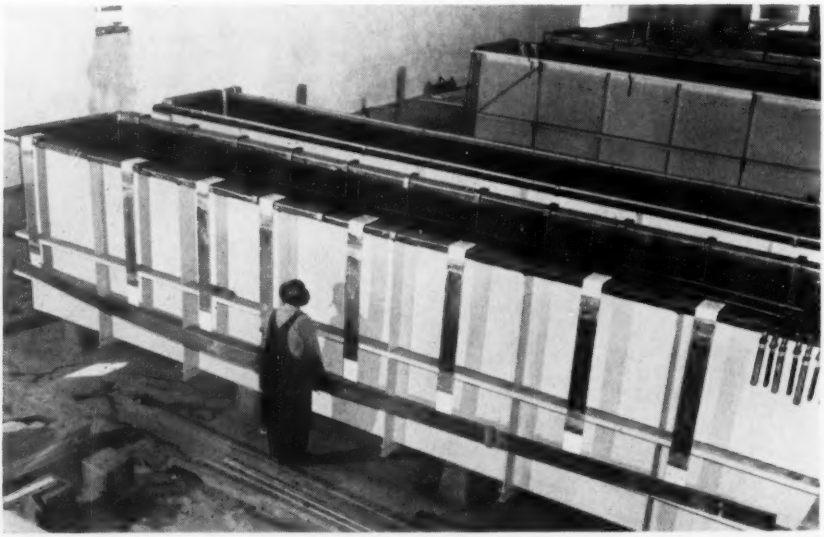

Workman lifts 28-foot-long section of aluminum bus bar during installation of the lightweight cast bus at Aluminum Extrusion Company's Los Angeles plant. The bus was designed to carry a capacity of 840 amperes per square inch. It feeds current to a large anodizing tank. (Photograph courtesy Kaiser Aluminum & Chemical Corp., Oakland, Calif.)

Another new development from Detrex:

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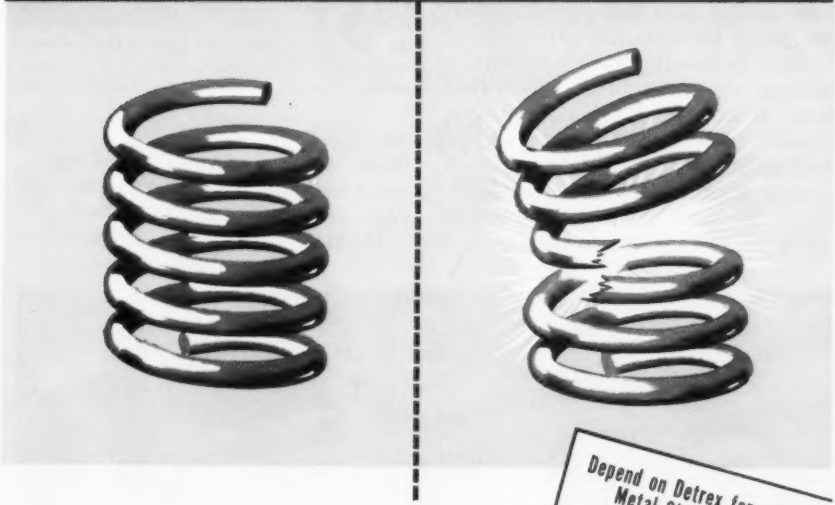

Detrex' new alkaline pickle removes rust, heat scale and all surface soils, particularly metallic soaps and corrosion products *without* removing any of the base metal and *without* the danger of hydrogen embrittlement. Unlike acid pickles, Detrex M-10 does not cause dimensional changes in parts being cleaned. You save precious time and are assured of consistent high quality cleaning.

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How Pesco Products Improved Deburring

A new barrel finishing department at Pesco Products Division of Borg-Warner Corporation has cut costs and reject rates in producing precision parts for the aircraft and missile industry.

This Cleveland, Ohio manufacturer makes more than 18,000 different parts for vacuum pumps, fuel pumps, hydraulic pumps, hydraulic motors, electric motors, axial flow fans, electronic cooling packages, missile power packs and electro-hydraulic servo valves. Parts vary in size from ¼-inch squares weighing a fraction of an ounce each to parts 17 inches in diameter that weigh 12 to 15 pounds. Most of them are aluminum die castings, brass and steel castings, and various types of stampings.

Fig. 1—Before-and-after shot of a typical part manufactured by Pesco Products Div. of Borg-Warner. Part at left has uneven edges, burrs and raised metal. After barrel finishing, the part is smooth and still within dimensional tolerances. Careful grading of abrasive media prevents lodging of media in holes.

Until recently, deburring had

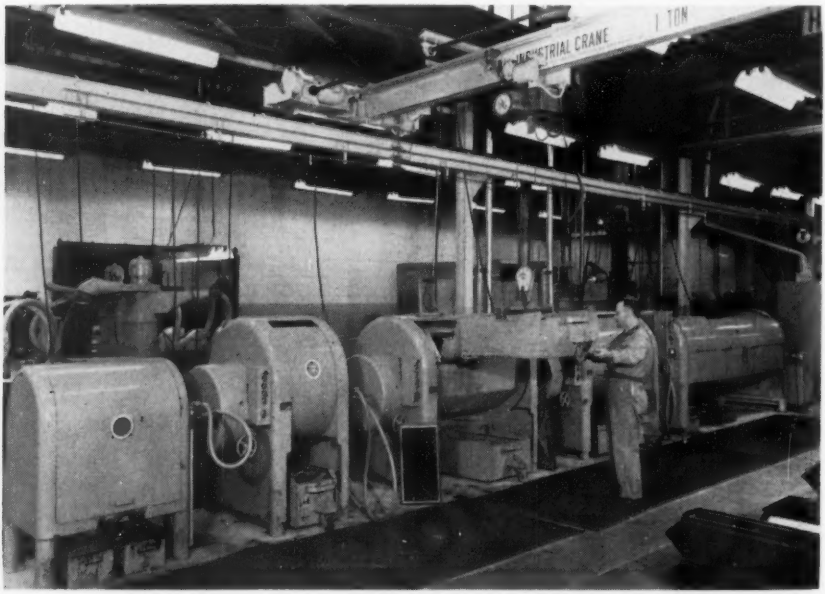

Fig. 2—Pesco's barrel finishing department has various sizes and types of barrels.

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Al Betteley of Bellevue Plating says:

"We are thoroughly satisfied with Udylite TEMPRON Cylinders. The only reason that we haven't bought more of them for our present equipment is that we haven't worn out the original ones. You may be sure that we will specify Udylite TEMPRON cylinders on any new equipment of this type."

the udylite corporation

detroit 11, michigan • world's largest plating supplier

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been quite a headache for this plant. Hand methods were not only expensive, but often resulted in excessive reject rates when the parts failed to pass rigid inspection standards. Lack of finished parts often caused production delays that resulted in falling behind on delivery schedules.

Barrel finishing has cut costs and reject rates have fallen to the point where stock of finished parts is adequate.

Pesco's method of setting up the barrel finishing system has produced first-quality results. The head man chosen for the barrel finishing department had seven years experience in tumbling operations. The company's process engineering de-

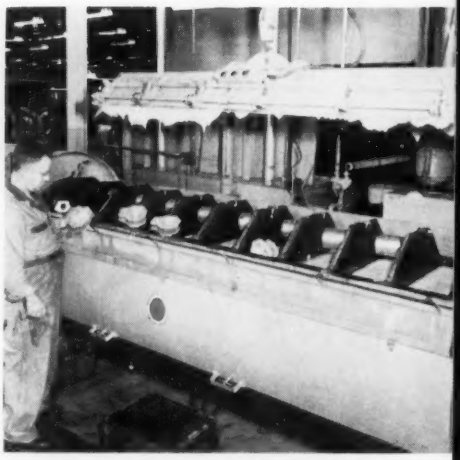
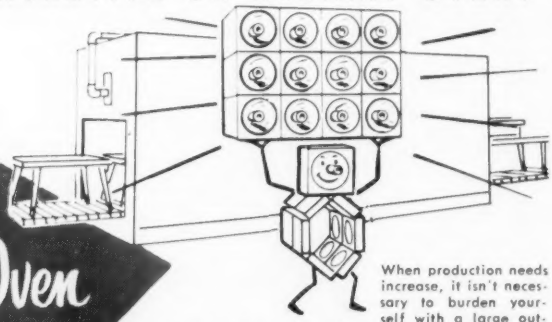


Fig. 3—Ten-compartment barrel finishing machine at Pesco. Parts to be deburred are either submerged loose in the media or suspended on fixtures that rotate in the media. (Photos courtesy Techline Division, Wheelabrator Corporation, Vicksburg, Michigan.)

Not enough OUTPUT FROM YOUR PRESENT CONVECTIVE OR RADIANT OVEN?

adding a small driQuik INFRA-RED Booster Oven often DOUBLES production



When production needs increase, it isn't necessary to burden yourself with a large outlay of capital for another big oven. A low-cost dri-Quik booster oven teamed with your present equipment will do wonders. In addition, it is flexible . . . temperature can be changed with the turn of a knob for different types of products. The booster oven can be any size or shape. *Write today for complete information.*

driQuik DIVISION

DRY CLIME LAMP CORP.
GREENSBURG, INDIANA

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LOOK FOR THE DIAMONDS—SIGN OF FINISHING QUALITY

4 good reasons why you should use IRIDITE Chromate Conversion Coatings ON YOUR ZINC OR CADMIUM PRODUCTS

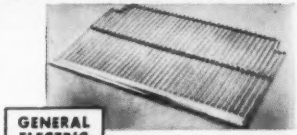
CORROSION PROTECTION—The wide range of Iridite coatings available gives you a choice of corrosion protection—from economical, mild protection of parts for shipment, storage or display, to extremely high protection under exposure to marine and highly humid atmospheres, gasoline or other hydrocarbons.

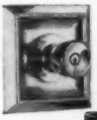
PAINT BASE—For an extremely tight bond for either baked or air-dried paints, non-porous Iridite blocks moisture penetration—prevents formation of metallic soap products beneath paint coatings.

APPEARANCE—Your choice of colors ranging from clear through yellow iridescent to olive drab. Bright Iridite finishes can also be dyed to provide other color effects.

SPECIAL EFFECTS—Iridite, in combination with other Allied Research processes, can provide a wide variety of finishes. As an example, Iridite 8-P applied to zinc or cadmium, followed by an application of Irilac, gives a highly attractive simulated brass finish.

IRIDITE—a specialized line of chromate conversion coatings for nonferrous metals. Easily applied at room temperatures with short immersion times, manually or with automatic equipment. Forms a thin film which becomes an integral part of the metal. Cannot chip, flake or peel. Special equipment, exhaust systems or highly trained personnel not required.





Medalist
NATIONAL LOCK COMPANY

For complete information on Iridite, contact your Allied Field Engineer. He's listed in the yellow pages under "Plating Supplies." Write for FREE TECHNICAL DATA FILES.

Allied Research Products, Inc.

4004-06 EAST MONUMENT STREET • BALTIMORE 5, MARYLAND
BRANCH PLANT: 400 MIDLAND AVENUE • DETROIT 3, MICHIGAN
West Coast Licensee for Process Chemicals: L. H. Butcher Co.
Chemical and Electrochemical Processes, Anodes, Rectifiers, Equipment and Supplies for Metal Finishing

IRIDITE® Chromates | IRILAC® Coatings | ISOBRITE® Brighteners | ARP® Supplies | WAGNER Equipment

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partment has set up a series of operation cards and work standards for each part and each operation. Each new part is run experimentally when it first enters the department to establish uniform work standards, media and compound requirements, length of finishing cycle and other operating procedures.

The equipment installed includes one 2-cubic-foot, two-compartment machine; one 5-cubic-foot, one-compartment machine; two 20-cubic-foot, two-compartment machines, and one 10-compartment machine with 3.2-cubic-foot capacity per compartment.

Many of the smaller parts are batch-finished in loads of up to 5,000 pieces. One of the smallest parts, a valve component, is finished in quantities of 10,000 pieces per batch. In contrast, other parts are finished one at a time, some while mounted on simple fixtures.

The only hand work now done in finishing these parts is preburring with a knife or by grinding. This is still required to assure that parts will meet the tough specifications (tolerances range from 0.0001 inch to 0.0005 inch and many specifications now stipulate that there shall be "no raised metal").

THE DICTIONARY
IS THE ONLY PLACE
WHERE SUCCESS COMES
BEFORE WORK!
ALKALI IKE
. . . and our success in overcoming the many cleaning problems normally encountered by the Plating Industry was only achieved by work. Work by our Research and Development Department, our Service Representatives and work by you, in cooperating with us on these cleaning problems.
Worthy of your consideration is . . .
APEX "ELECTRO 100"
CLEANING COMPOUND
A general purpose, low current density electrolytic cleaner, designed for direct or reverse current cleaning of non-ferrous metals. You will experience excellent detergency, water softening, rinsing and conductivity in using this product.
Your Inquiry
Will Be Appreciated!
Apex ALKALI PRODUCTS CO.
A complete line of Cleaning Compounds for the Metal Finishing Industry
Main and Rector Streets • Philadelphia 27, Pa. • IV 3-3939
SYRACUSE BOSTON DETROIT ATLANTA PITTSBURGH WEST HARTFORD
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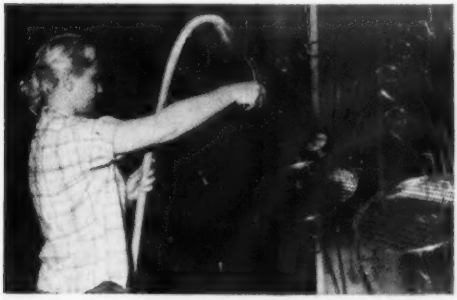
RANSBURG

What Would Paint Savings Like This* Mean in YOUR Finishing Department?

Quality is all important in the production of fine Metalcraft furniture by George Koch Sons, Inc., Evansville, Indiana.

That's why they use the Ransburg Electrostatic Hand Gun to apply a uniform clear coating on their brass-plated furniture. The protective coating is baked on. Although the bulk of their present production is in the popular brass line, they still paint the metal furniture in a variety of colors with the Hand Gun.



Painting is CLEANER . . . QUICKER . . . CHEAPER *with the Ransburg Electrostatic Hand Gun.*

*10 GALLONS OF PAINT NOW DOES THE JOB WHICH FORMERLY TOOK 30 GALLONS

On one item—a TV table—they formerly used 30 gallons of enamel to coat 1000 units by combination dip and air spray method. Now—with the Ransburg Electrostatic Hand Gun, they paint 1000 tables with only 10 gallons. And, they get a better, more uniform coating, too.

No Reason Why You Can't Do It, Too!

See how the Electrostatic Hand Gun can save time . . . paint . . . and cut costs in YOUR finishing department. Or, if your production justifies, it'll pay you to investigate Ransburg's automatic electrostatic spray painting equipment. Write for our No. 2 Process brochures which show numerous examples of modern production painting in large and small plants.

Call or write **RANSBURG Electro-Coating Corp.**

Box-23122, Indianapolis 23, Indiana

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DYNA-EMPIRE PLATEGAGE

MODEL D-873

precise plating thickness measurements from .0001 to .015" in a matter of seconds

In inspection and production—wherever precise plating thickness measurement is essential, the Dyna-Empire PLATEGAGE provides a rapid and simple means of determining the thickness of a plated or painted surface on ferrous base metals. These PLATEGAGE features assure production speed and ease of operation—laboratory accuracy • *Direct reading*—of plating or coating thickness from .0001" to .015" • *Precise measurements of any contour with specially designed probe tip* —inside or outside diameter (as low as 1/16" O.D. and ½" I.D. on contoured surfaces) of pipes or tubing and holes in stampings, and castings. • *Easy operation by unskilled operators* — one probe covers all measurements; no special scales to set up — no calibration curves needed. Read coating thickness directly on the meter. • *Non-destructive measurements*—no parts wasted in tests. • *Transistorized construction*—guarantees long operating life • *Completely portable—weight only 9 lbs.;* battery or line operated. • *No extras to buy*—unit complete with batteries, a universal probe to cover every measuring need and two thickness reference samples.

Fast and accurate direct thickness measurements of these platings: Silver, copper, nickel, chromium, cadmium, zinc, brass, tin, etc. on iron or steel base materials. Measurement of paint thickness on automobile bodies, refrigerator cabinets, transformer casings, iron or steel cans, etc.

Price $345.00 complete

DYNA-EMPIRE, INC. 1075 Stewart Ave., Garden City, N. Y.

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CLEANING VERSATILITY by Cincinnati

Combines

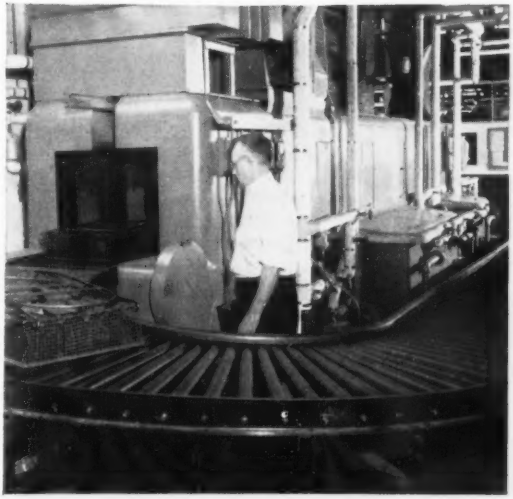
Belt Conveyor and Monorail Conveyor

- **Washes**
- **Rinses**
- **Rust Proofs**
- **Dries**

Processes

- **Steel**
- **Cast Iron**
- **Brass**
- **Aluminum**
- **Stainless**
- **Stampings**
- **Castings**
- **Screw Machine Parts**
- **Die Castings**
- **Machined Parts**
- **Forged Parts**

In many cases, Cincinnati engineers are called upon to design equipment to clean one particular part. In others, they have to come up with a machine that will clean anything in the plant . . . present and future! Installed in the New York State division plant of a noted American manufacturer, the machine illustrated is such a "jack of all trades". It handles all pre-finishing, pre-inspection and pre-assembly cleaning for the complete plant. It's another example of Cincinnati's ability to engineer equipment to a problem and to a budget, too.



What's your problem? Ask for a no-cost, no-obligation survey of cleaning requirements by: **Cincinnati Cleaning & Finishing Machinery Co., 2008 Hageman St., Cincinnati 41, Ohio**

For more data circle 457 on Postpaid Card

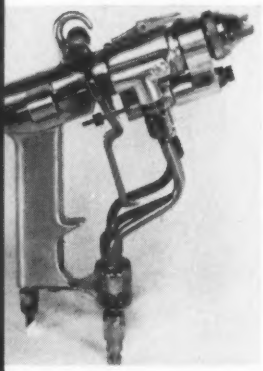
new Equipment, Materials, Processes

Polishing, Buffing, Degreasing, Cleaning, Barrel Finishing, Plating, Anodizing, Phosphatizing, Baking, Vacuum Metallizing, Chromate Coating, Paint Finishing, Waste Treatment.

Plural-Component Spray Equipment

Binks Manufacturing Company has introduced equipment that is said to be "a significant development in the spray application of plastics and other plural-component materials."

Consisting of a special spray gun and a special pumping unit, the Binks equipment makes possible fast, continuous application of plastics, including polyesters, epoxies, gel-coats, urethanes, foam-in-place materials and others that require mixing two components.



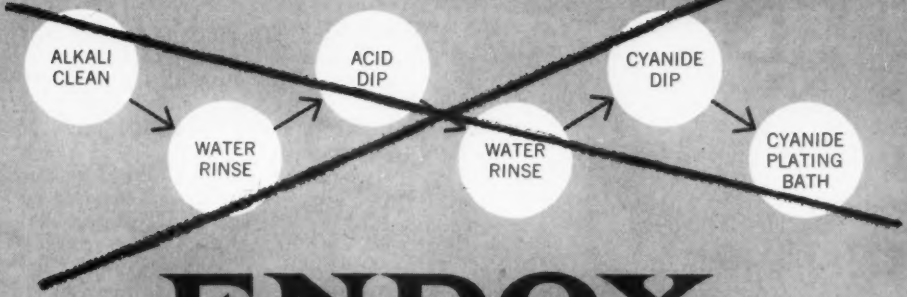
Binks Turbulator spray gun internally mixes plural-component materials just before spraying.

Since curing of such materials depends upon chemical reaction between the components, and since these materials set up or harden very quickly when the essential components are brought together, such materials have to be applied rapidly after they are mixed. The Binks equipment mixes the essential elements right in the spray gun and then sprays them immediately.

The pumping unit used, called a "Formulator," holds supplies of activator, catalyst and resin. Electrically driven pumps are adjusted until they deliver the right amounts of each material to the special spray gun.

The spray gun, called the "Turbulator," instantaneously mixes the components delivered to the Formulator by forcing the elements through high-speed rollers driven by an air motor built into the gun. The mixture is dis-

Turbulator gun is fed a continuous supply of components, atomizing air and air to operate the mixing element in the gun. Formulator unit (left) has one tank for catalyst and activator, one for resin or base element, and a third for cleaning solvent.



ENDOX

the PATENTED alkaline deoxidizing process prepares steel for plating in one simple step!

In one, simple electrolytic operation, Endox completely removes rust, scale, smut, soil and oxides from steel and activates it for plating. On work that has been precleaned to remove heavy solid soils, no alkali cleaner, acid dip or cyanide dip are required. Endox replaces them all and gives superior plate adhesion, especially on difficult-to-activate alloy steels. Acid attack and acid fumes are eliminated by use of this room-temperature, alkaline process.

Endox cuts rinse water volume (and rinse water waste treatment costs) way down since there's only one brief rinse in the entire cycle prior to plating in a cyanide plating bath. Endox solutions contain sodium cyanide and are compatible with all cyanide plating solutions.

Endox also produces excellent results prior to acid plating baths. It has solved many problems involving adhesion of nickel plate to malleable iron and alloy steel parts which are later subjected to stress. Prior to acid plating, however, the alkaline Endox residue should be neutralized by a dilute acid dip or "sour rinse".

Endox can be used in both barrel and rack plating lines. Endox solutions are very economical to use because they can be maintained indefinitely by periodic analysis and replenishment, just like a plating bath.

Enthone pioneered alkaline deoxidizing and derusting and first introduced such techniques in 1951. In recognition of this, Patent No. 2,915,444 has been awarded to Enthone. Benefit from our long experience in alkaline pickling; write for literature on Endox and the name of your nearest Enthone representative who will be glad to process sample parts for you. Enthone, Inc., 442 Elm Street, New Haven, Connecticut.

ASARCO

ANOTHER PRODUCT OF Enthonics RESEARCH

ENTHONE

A Subsidiary of American Smelting and Refining Company

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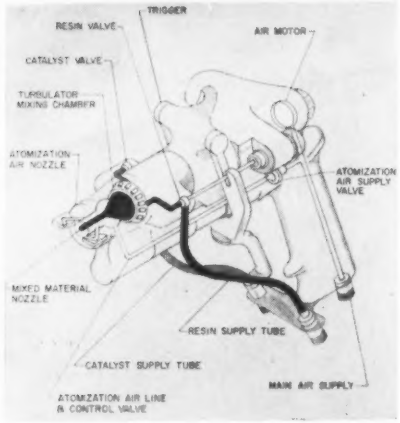


Phantom view shows working parts of the Binks plural-component spray gun

charged from the gun through a spray nozzle just a fraction of a second after mixing within the gun.

The unusual method of mixing used in this system produces a homogeneous film, does away with the necessity for mixing small quantities of components to avoid hardening prior to application.

Among the applications for this spray gun are lining storage tanks; coating structural steel, building surfaces, aircraft and missile components; applying structural resins in the manufacture of boats, swimming pools, furniture and appliances; and applying plastic foams for insulation, cushioning, and sandwich panels.

Manufacturer: Binks Manufacturing Co., 3118-40 Carroll Ave., Chicago 12, Illinois.

For more data circle 1 on Reader Service Card

★ ★ ★

Acid Bright Gold

Technic, Inc. recently developed Orotherm HT, a 24Kt acid bright gold plating solution.

(continued)

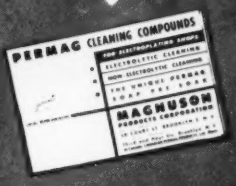
Did You Get Your Copy of This... HANDY DIGEST OF ALL CLEANING OPERATIONS ON THE JOB?

CONTAINS LATEST INFORMATION ON:

- Removing Buffing Compound
- Electrolytic Cleaning
- Selection for Alloys
- The Unique Soap Pre-Soaks
- Solvents and Emulsions

MAGNUSON PRODUCTS CORP.
Executive Offices:
50 COURT ST., BROOKLYN 1, N. Y.
In Canada: Canadian PERMAG Products, Ltd., Montreal

YOURS FREE!



Send for your free "vest-pocket" reference for both electrolytic and non-electrolytic cleaning requirements.

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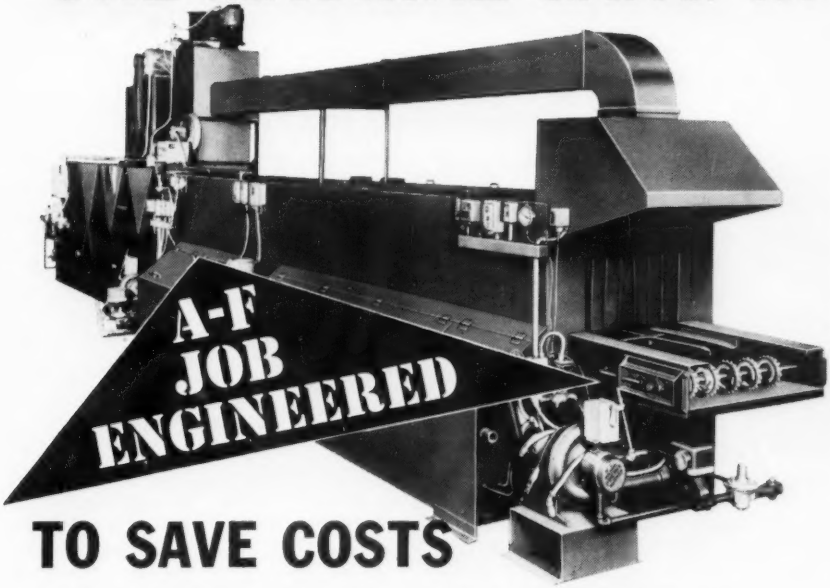
HERE'S A "ONE-MACHINE-GANG"...



TO SAVE COSTS

Job Engineered for a plant where pots and pans of aluminum and steel are manufactured, this new A-F Machine *washes, rinses, deionizes* (to prevent lime spotting) and *dries* the pots and pans spotlessly clean—eliminating further operations before packing.

It ensures quality control for mass-produced, low-priced products—at a lower cost than you would imagine!

And, here's an A-F extra . . which saved money for the pan manufacturers in still another way. They owned a stainless steel conveyor belt, so *A-F built this machine around their conveyor belt*—an outstanding example of A-F Job Engineering and custom-building.

Do *you* have a metal cleaning problem? A-F Job Engineering can help you solve it.

Why not write today?

A-F

A-F JOB *ENGINEERED*

Cleaning and Finishing Machines

THE ALVEY-FERGUSON CO. • 626 Disney Street • Cincinnati 9, Ohio

For more data circle 343 on Postpaid Card

Orotherm HT is a gold complex offering many application possibilities, especially where heat resistance is specified.

This recently developed gold plating solution has the following characteristics, the manufacturer reports:

Heat resistance, 400 deg. C., 5 hours minimum; no strike solution required; 24Kt deposit, not an alloy; greater wear resistance; greater electrical conductivity; brilliant deposit; wide current density range (1-20 a.s.f.); simple operation and definite control; no accumulation of deleterious sludges; increased hardness (150 + Knoop); increased tarnish resistance; wide temperature range (60-115 deg. F.); tighter-grained deposit; better adhesion of deposit; good throwing power.

Manufacturer: Technic, Inc., Dept. NR, P. O. Box 965, Providence, R. I.

For more data circle **2** on Reader Service Card

★ ★ ★

Corrosion Test Cabinet

Newly designed accelerated corrosion testing equipment has been announced by Industrial Filter & Pump Mfg. Co.

The salt-fog, humidity - test cabinet is a self-contained unit requiring no auxiliary tanks, mixers or pumps.

Designed in sizes to accommodate test specimens, panels or entire product in simulated environments, the cabinets meet requirements of most federal and commercial test specifications.

Standard - size or special-size test cabinets to conduct "Cass," Corrodkote and other accelerated environmental test requirements are design-

(continued)

SURESEAL MOST SPECIFIED WHERE

- ✔ the handling of acids and other corrosive materials demand maximum hand protection.
- ✔ production requirements prescribe fast, sure handling of caustic liquids.
- ✔ positive protection against crippling and disfiguring accidents is a necessity.
- ✔ longer glove life is needed.

Surety Sureseal Gloves, (made from Hycar) give positive protection against the greatest number of acids and other corrosive liquids and wear up to 14 times longer than competitive materials. They are more snag, abrasion and puncture-proof and the exclusive Surety Turn-Cuff gives added protection for arms and prevents liquid from getting into the glove.

Tell us your requirements and test a pair today — at our expense. Write on your letterhead naming your glove jobber and you will receive a pair by return mail.

THE SURETY RUBBER CO.
CARROLLTON, OHIO

IN CANADA: Safety Supply Co., Toronto

WESTERN SALES REP.: The Macintosh Co., 3030 Bridgeway, Sausalito, Calif.
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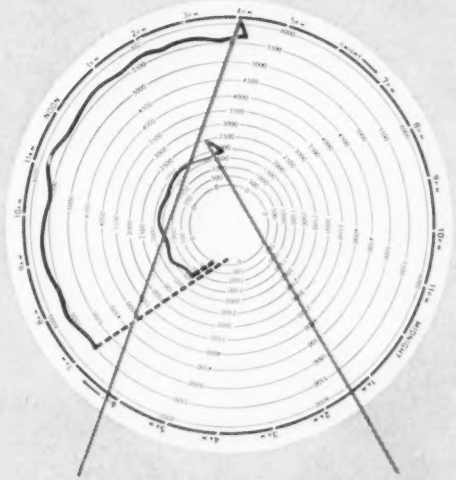
STEAM RECORDERS SHOW

$25,000 a year savings



HOT PHOSPHATING LINE—
5742 lbs. steam per hour

COLD BONDERITE LINE—
1561 lbs. steam per hour

. . . WITH COLD BONDERITE SYSTEM

A manufacturer of household appliances decided to find out for himself! Steam recorders were hooked to two identical 5-stage phosphating lines—one using conventional hot solutions and the other line using the Cold Bonderite System.

Steam consumption on the "hot" line measured 5742 pounds per hour; the Cold Bonderite line used only 1561 pounds per hour. A difference of 4181 pounds, or *72.8%!*

Converted to dollars, the manufacturer estimates that Cold Bonderite, on all his production, will save $25,878 per year.

He is changing his other phosphating lines to the Cold Bonderite System as quickly as he can!

Cold Bonderite Systems operate at temperatures from 40 to 75° below conventional phosphate systems for surface treatment of metals. Coatings are of highest quality. Savings are *automatic*. Balanced formulation permits the use of accelerated solutions, easy to operate and control. You can choose between zinc or iron phosphates. Spray or immersion application to fit your production requirements.

The changeover to a Cold Bonderite System is simple and quick. Act now. You can have it installed and working to save you money by this time next week.

Call in your Parker representative today!

Since 1914— leader in the field

Parker Rust Proof Company

2172 E. MILWAUKEE, DETROIT 11, MICHIGAN

BONDERITE corrosion resistant paint base	BONDERITE and BONDERLUBE aids in cold forming of metals	PARCO COMPOUND rust resistant	PARCO LUBRITE—wear resistant for friction surfaces	TROPICAL—heavy duty maintenance paints since 1883

**Bonderite, Bonderlube, Parco, Parco Lubrite—Reg. U.S. Pat. Off.*

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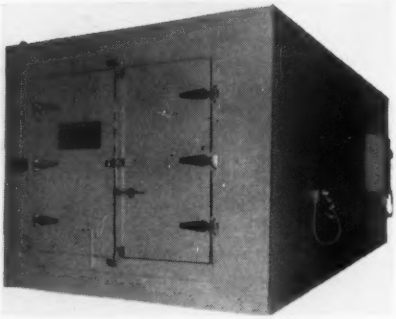
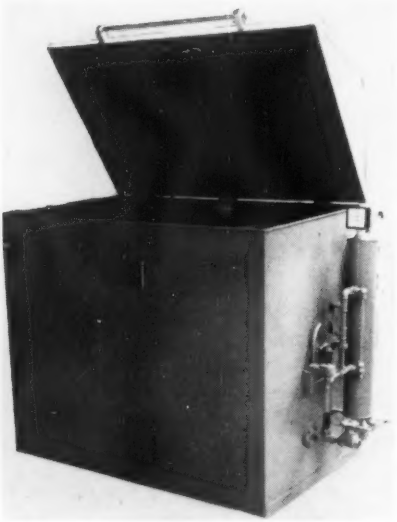


Industrial Filter's Redesigned Test Cabinets



ed and built to rigid specifications.

Manufacturer: Industrial Filter & Pump Mfg. Co., 5904 West Ogden Ave., Cicero 50, Ill.

For more data circle **3** on Reader Service Card

★ ★ ★

Paint Stripper

Quick Strip No. 5 is a non-flammable alkaline organic-solvent-type paint stripper which wrinkles paint, then allows it to be flushed off with water.

This product will remove many different coatings, including lacquers and epoxy-based products, which are normally difficult to strip.

It is used at room temperature in steel tanks. Contains retarders that slow solvent evaporation and inhibitors that protect the metal surface from corrosion before it is refinished. Formulation available for use where brush or spray application are only methods that can be used.

Manufacturer: The Mitchell-Bradford Co., Wampus Lane, Milford, Connecticut.

For more data circle **4** on Reader Service Card

★ ★ ★

Equipment for Fluidized-Bed Coating

Equipment for applying plastic coatings by the fluidized-bed process has been developed by Armstrong Products Co. The unit consists of a vessel with porous ceramic floor, which holds the powdered resinous material to be used for coating; mechanism for aerating and vibrating the coating powder to produce the "fluidized bed."

Vibro-Fluidizer

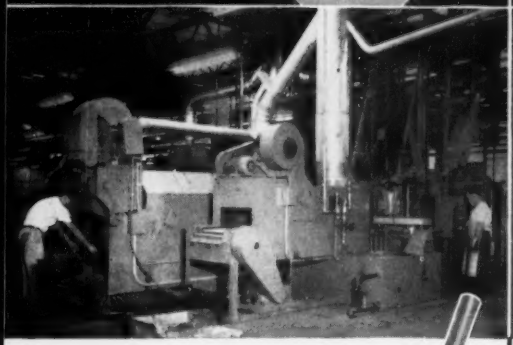
The dip coating process consists of dipping a moderately preheated article into the fluidized bed of coating resin. The particles melt and bond to the surface, forming a continuous coating.

Manufacturer: Armstrong Products Co., 355 Argonne Rd., Warsaw, Ind.

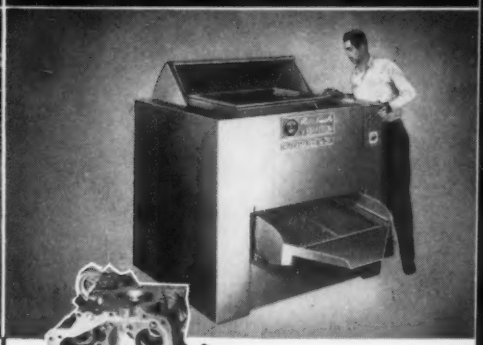
For more data circle **5** on Reader Service Card

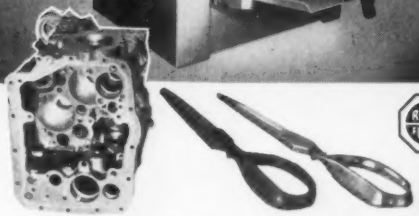
For more data on advertisement on opposite page, circle 346 on Postpaid Card——→

CALL ON **RANSOHOFF ROTO-FINISH** FOR *Engineering* FINISHING RESULTS



THIS AUTOMATED CLEANING AND FINISHING SYSTEM installed at Elco Tool & Screw Company, Rockford, Illinois removes wire coat from blanks; and washes, rinses, and dries 90,000 lbs. of finished nuts, screws and bolts per day. This system cleans tote pans automatically at the same time. Whether your production requirements are large or small, this is the kind of finishing *result* you can expect from Ransohoff.





A NEW VIBRATORY FINISHING MACHINE, the Vibratron, was designed by Roto-Finish to finish cast; forged and machined parts with shielded and hard-to-reach surfaces. It cleans, deburrs, descales, forms radii and fine finishes in very short time cycles. If desired, the Vibratron can be equipped to load and unload automatically.

THERE'S NO ROOM FOR GUESS WORK OR COSTLY HAND FINISHING TODAY. It's simply a matter of designing the right equipment and developing the right processing techniques for the job. Ransohoff/Roto-Finish, with a combined experience of 62 years in the finishing field know-how to solve your finishing problems quickly—efficiently—and economically.

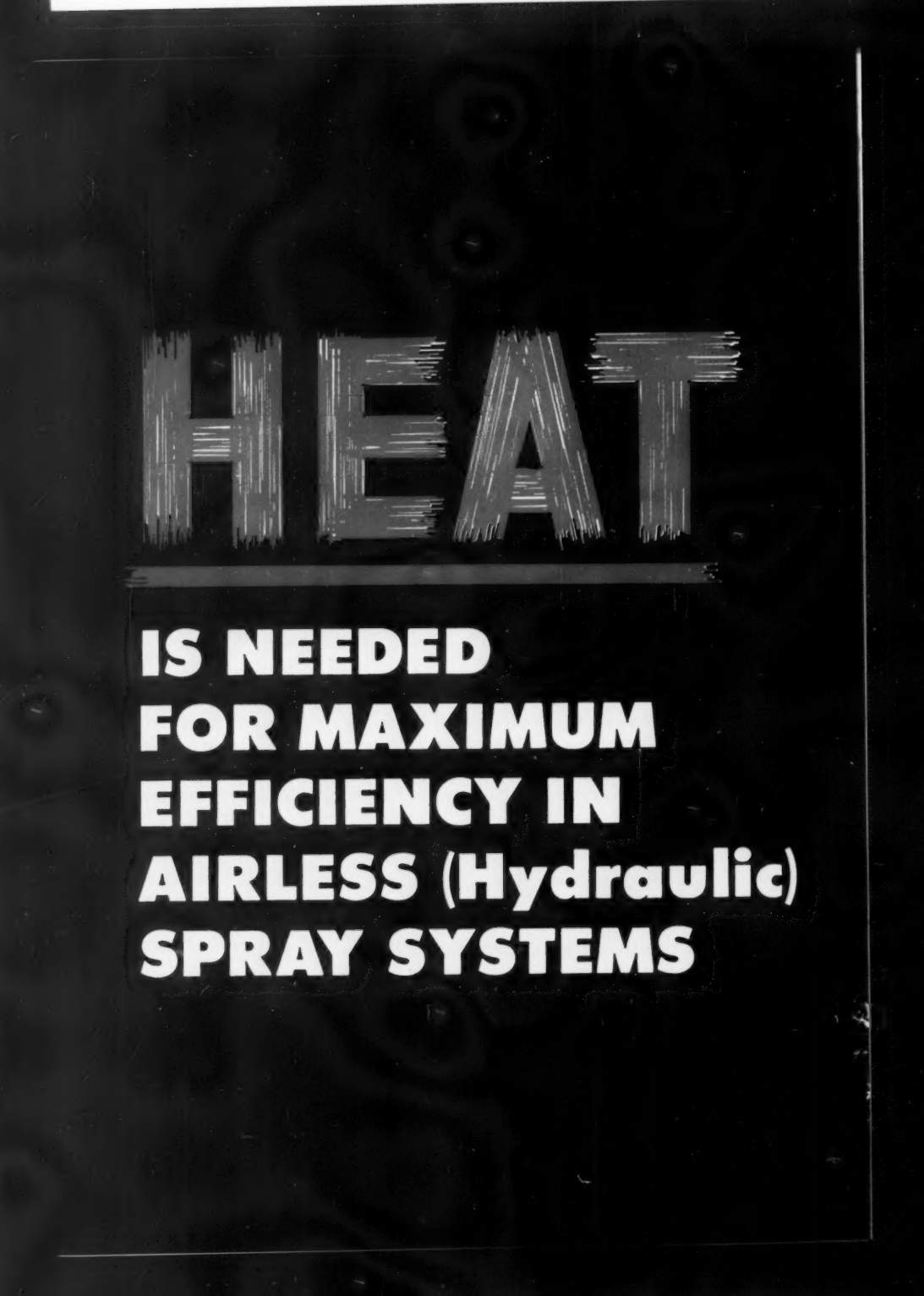
Small wonder so many manufacturers, large and small, rely on Ransohoff/Roto-Finish to engineer finishing *results* with equipment and techniques they can depend on!

Get the Complete Story

Write for Ransohoff literature or request the Vibratron folder, today.

RANSOHOFF/ROTO-FINISH

20 NORTH FIFTH STREET
HAMILTON, OHIO


HEAT
IS NEEDED
FOR MAXIMUM
EFFICIENCY IN
AIRLESS (Hydraulic)
SPRAY SYSTEMS

HEAT

lowers and controls viscosity with less use of solvents. Lower working pressures can be used, that means less over spray, less waste of coating materials.

HEAT

...controlled heat eliminates variances due to climatic changes.

Find out how Hot Airless can help you save money and do a better coating job, too! Write

NORDSON CORPORATION
88 Jackson St., Amherst, Ohio

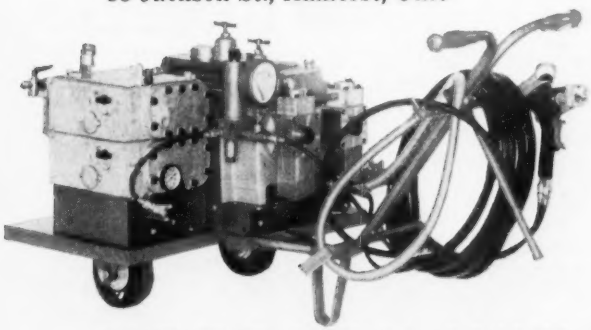
HEAT

makes it possible (because less solvents are needed) to apply coating materials with high solids content – heavier films when desired.

Improved flow-out, eliminates orange peel and blushing.

HEAT

provides greater flexibility, greater control of film thickness and finish. Quality is controlled, rejects cut.



NORDSON HOT AIRLESS

The Only System With all the Advantages of Airless Plus HEAT

For more data circle 347 on Postpaid Card

Steel Sheet for Direct-on Porcelain Enameling

Armco Steel Corporation has introduced a steel sheet that is suitable for direct application of porcelain enamel finish coats without a ground coat.

The special sheet metal, known as Univit, is produced from an improved grade of enameling iron with special processing in the mill. Now a single finish coat of porcelain enamel can be applied directly to the base metal in one firing operation.

The most important aspect of the new sheet is that freedom from fish-scaling and boiling of the porcelain enamel finish is assured. This makes possible the successful application of a single finish coat in white or color directly on a fabricated metal part. The conventional ground coat required for regular enameling grades of iron and steel is eliminated.

It is anticipated that Univit will have its widest use in the major appliance industry. Exposed parts subject to high inspection standards, such as range, washer and dryer tops, will have a smoother surface and will resist mechanical damage to a greater degree than those enameled by conventional two-coat practice, the producer said.

Manufacturer: Armco Steel Corporation, Middletown, Ohio.

For more data circle **6** on Reader Service Card

★ ★ ★

All-Plastic Fan

All parts of the Heil Rigivin Fan exposed to corrosive fumes, including the housing and wheel, are constructed

(continued)

SPRAY NOZZLES

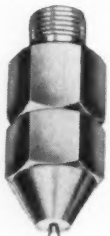
greater choice of patterns

Full Cone

Hollow Cone

Square Spray

Flat Spray



greater choice of capacities

greater choice of materials and spray nozzle types

WhirlJet hollow cone spray

FullJet full cone spray

Pneumatic Atomizing Nozzle

FlatJet flat spray

Over 12,000 Standard Spray Nozzles
for more exact performance
to fit your needs

For complete information write for Catalog No. 24

SPRAYING SYSTEMS CO.
3229 Randolph Street • Bellwood, Illinois

For more data circle 348 on Postpaid Card

Slight Problem with Foaming?

You'll find your answer in this new trio of *non-foaming spray washing compounds* — designed to out-perform any other cleaners on the market, yet guaranteed non-foaming at *any* solution strength.

Featuring a radically different *non-foaming* surfactant, these new Magnus compounds eliminate all restrictions on solution strength, simplify "make-ups" and insure both *unmatched cleaning and free-rinsing.*

Write for FREE folder

MAGNUS 91X3
for Aluminum and Light Duty Cleaning.

MAGNUS 92X3
for Brass, Copper, Steel and Certain Alloys.

MAGNUS 94X3
for Heavy Duty Cleaning of Steel.

magnus
CHEMICAL COMPANY INC
208 SOUTH AVENUE GARWOOD, NEW JERSEY

☐ Please send free folder on your new non-foaming spray cleaners.

☐ Please have service representative call to survey our cleaning problems.

NAME _____

POSITION _____

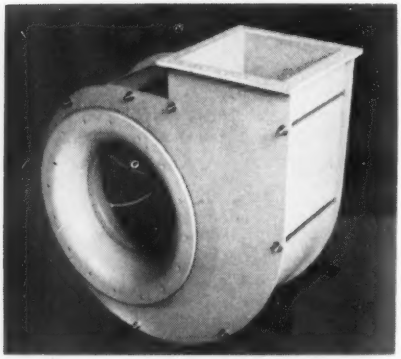
COMPANY _____

ADDRESS _____

CITY _____ STATE _____

EQUIPMENT • CHEMICALS • METHODS

For more data circle 349 on Postpaid Card



Heil PVC Fan: corrosives don't corrode it

of solid, unplasticized polyvinyl chloride, a plastic unaffected by most corrosives. The fan is provided with heavy, oversize, outboard bearings and is designed to operate at well below its critical speed.

This fan reduces substantially the amount of maintenance required in installations where corrosives must be exhausted, the manufacturer reports.

Manufacturer: Heil Process Equipment Corp., 12901 Elmwood Ave., Cleveland 11, Ohio.

For more data circle **7** on Reader Service Card

★ ★ ★

Rust Preventative

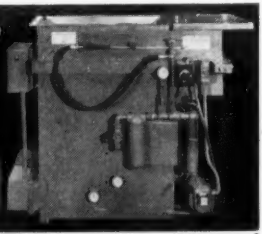
Paralan, a rust and oxidation preventative introduced by American Lanolin Corporation, is made with a special lanolin base. It can be applied by brushing, spraying, roller coating, dipping. Will not clog or damage filtering systems. Excellent coverage attained. Completely volatilizes in annealing furnaces—will not stain. Regular solvent or alkaline cleaning removes Paralan. Also serves as a light stamping and drawing compound, drilling lubricant and coolant.

Manufacturer: American Lanolin Corporation, Lawrence, Mass.

For more data circle **8** on Reader Service Card

For absolute cleanliness, low cost CIRCO ultrasonic degreasers and washers

CORROSION RESISTANT, STAINLESS CLAD CONSTRUCTION from $1595.00 (729 cu. in. cleaning area)



In case after case, where **absolute** product cleanliness is critical, CIRCO does the job...does it faster...does it cheaper. Choose from standard models to huge custom-designed conveyerized systems, **or** convert your present cleaning equipment merely by adding CIRCO ultrasonic transducers and controls. And, where conventional cleaning is sufficient, CIRCO offers a complete line of degreasing and washing units and degreasing solvents.

CIRCO Equipment Company

51 Terminal Ave., Clark, New Jersey • FUlton 8-8600

For more data circle 350 on Postpaid Card

Automatic Buffing Machine

An automatic polishing and buffing machine that finishes round, square, hexagonal or octagonal tubular metal parts has been developed by Acme Manufacturing Company.

The machine is useful for finishing tubular shapes for plumbing hardware, lighting fixtures and furniture. It can also be used for automatic deburring operations on tubular - shaped parts or parts having holes that enable them to be chucked on a mandrel.

Buffing wheels, abrasive belts, set-up wheels or wire brushes can be used on the machine to perform the finishing or deburring operations.

The machine consists of a motorized head, reciprocating work table, and a cam-operated index mechanism for a group of mandrel assemblies mounted on the table. It can be made as one unit or with separate reciprocating table and adjustable head units. Standard models of the machine have a maximum table travel of 48 inches, handle parts up to 42 inches long.

To operate the machine, the parts are loaded over mandrels. Loading is easy.

With the work loaded into position, the mandrels lower to work position and are reciprocated under the buffing wheel. At the end of each reciprocation the mandrels index automatically to present another part surface for

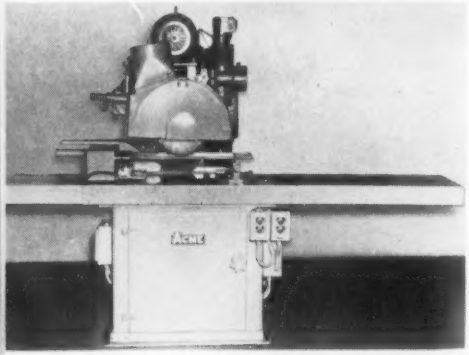
GRIPALLOY®

primer and enamel

. . . A Corrosion Resisting, Metal Etching Coating, designed as a primer . . . . May also be used as a top coat . . . . Available in all colors . . . . Tight adhesion to 25 different metals . . . . A natural for Magnesium Alloys, Aluminum and Non-ferrous metals . . . . Air dries in 5 minutes for most topcoats.

TENAX FINISHING PRODUCTS CO.
Newark 5, New Jersey

Lacquers — Enamels — Synthetics — Vinyls
For more data circle 351 on Postpaid Card



This Acme automatic polishing and buffing machine finishes round, square, hexagonal or octagonal-shaped tubular parts.

finishing. Up to eight mandrels can be mounted on the reciprocating table, depending upon the diameter of the work to be finished.

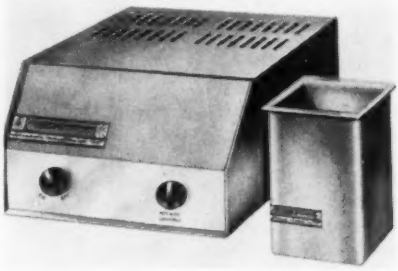
Manufacturer: Acme Manufacturing Co., 1400 E. Nine Mile Rd., Detroit 20, Mich.

For more data circle **9** on Reader Service Card

★ ★ ★

Economy-Model Ultrasonic Cleaner

An economy-model ultrasonic cleaner has been introduced by Ultrasonic Industries, Inc.



System Forty Ultrasonic Cleaning Unit

Tanks in single and multiple—Power equipment — dryers — filters — heat exchangers — chemicals—anodes—ventilation, etc.

Barrel assembly units are made to fit all makes of tanks.

The New STUTZ PLATING BARRELS

- **Low Head Room Design**
- **New Materials**

Sizes 12" to 18" inside diameter—24" to 42" long—perforations 3/32" standard. All other sizes available.

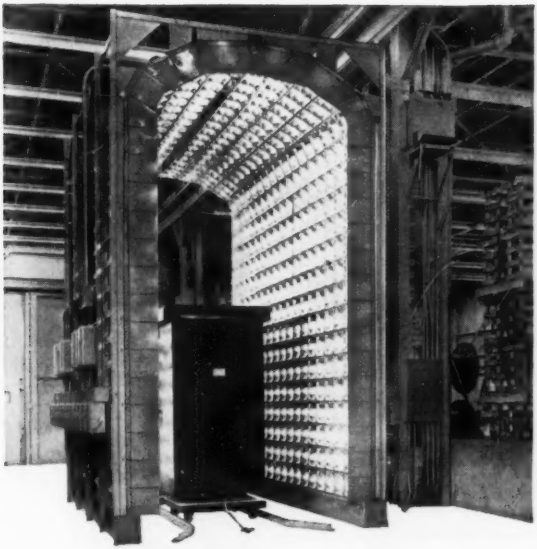
Cylinder rotation in this design is provided by motor drive mounted directly in super structure bridge member. Total weight and overall height has been greatly reduced. Handling therefore is fast and smooth. Cylinder transported from one operation to the next under continuous rotation. In this manner solution dragout is reduced to a minimum. Rinsing time following alkali cleaning, acid pickling, etc., is greatly reduced. Overall dimensions of tanks is lessened by the elimination of motor drive platform. Electric service 440, 220, or 115 volt with grounded cable and Hubble-lock heavy duty safety connector.

We Invite Your Inquiries

THE STUTZ CO., 4410 Carroll Ave., Chicago 24, Ill.

Serving Industry 35 Years

For more data circle 352 on Postpaid Card



at Hudson Falls, New York . . .

G. E. BAKES PAINTS ON VARIOUS-SIZE CAPACITOR HOUSINGS . . . WITH SINGLE FOSTORIA INFRA-RED OVEN

The need was for a paint-baking oven that could economically and satisfactorily handle both large and small sizes of General Electric capacitor housings. Fostoria designed and built an oven that met G. E.'s needs completely.

Here's the story:
The housings—ranging from 6′ to 12′ high—are coated with a Glyptal* type of paint, formulated to withstand rugged outdoor weather conditions. Paint specs call for a total bake of 30 minutes at 300°F. After exhaustive lab tests at Fostoria, the oven was designed to provide completely zoned operation, thus enabling proper baking of variously sized and shaped housings. Zones of lamp banks are used only as needed.

Correct baking and product temperatures are also achieved by varying lamp wattages within the various oven zones, plus input controllers in the zone circuits themselves. Maximum efficiency during all baking sequences is made possible through careful over-all oven design.

Fostoria Infra-Red ovens and systems are engineered for a wide range of industrial heating applications . . . saving time, money, space, labor with every installation. Write for "Radiant Heat —Applications Unlimited." Fostoria Corporation, Fostoria, Ohio.

Fostoria Ovens are used for

- baking • dehydrating
- drying • preheating
- many other industrial heating applications.

FOSTORIA

*Reg. trade mark of General Electric Company

For more data circle 353 on Postpaid Card

The Disontegrator System Forty holds a half-gallon.

It will remove more than fifty types of soils and contaminants in seconds from virtually thousands of different products, ranging from surgical instruments, watches, clocks and false teeth to highly complex electronic components used in satellites and missiles.

The System Forty includes a 40-watt generator with an output of 90,000 cycles per second. The cabinet measures 10 by 8 by 5¾ inches high.

Manufacturer: Ultrasonic Industries, Inc., Albertson, L. I., N. Y.

For more data circle **10** on Reader Service Card

★ ★ ★

Trailer-Borne Air Compressor

A trailer-borne compressor which is small and economical yet delivers pressures required for airless spray painting and large maintenance jobs is now available from the DeVilbiss Company Toledo 1, Ohio.

The 6-h.p. unit is particularly recommended for maintenance painting.

The compact trailer-mounted compressor delivers 15 c.f.m. at 80 lbs. and 13.5 c.f.m. at 125 pounds.

Compressor has two-cylinder, single-stage pumps, forced-air cooling, ball-bearing construction, automatic, measured-feed oiling, quiet, quick-acting valves and an automatic unloader which can be set for normal or high-pressure operation.

Performance data: Pressure, 125 p.s.i.; 4.2 h.p.; compressor r.p.m.,

(continued)

At Last...

Positive Protection Against

Paint Spray

with the NEW

FLEX-A-PRENE®

PAINT MASK

New Efficiency

The sensational new FLEX-A-PRENE Paint Mask keeps out paint pigments and solvents with amazing efficiency, yet it's light (just 1 ounce), comfortable and so easy to talk and breathe through you hardly know you're wearing it.

New Economy

Flex-A-Prene's low first cost is only part of the story. Most important savings come from its endurance in service and time saved through less frequent filter replacements. You can expect at least 100 hours of exposure before filter replacement is necessary.

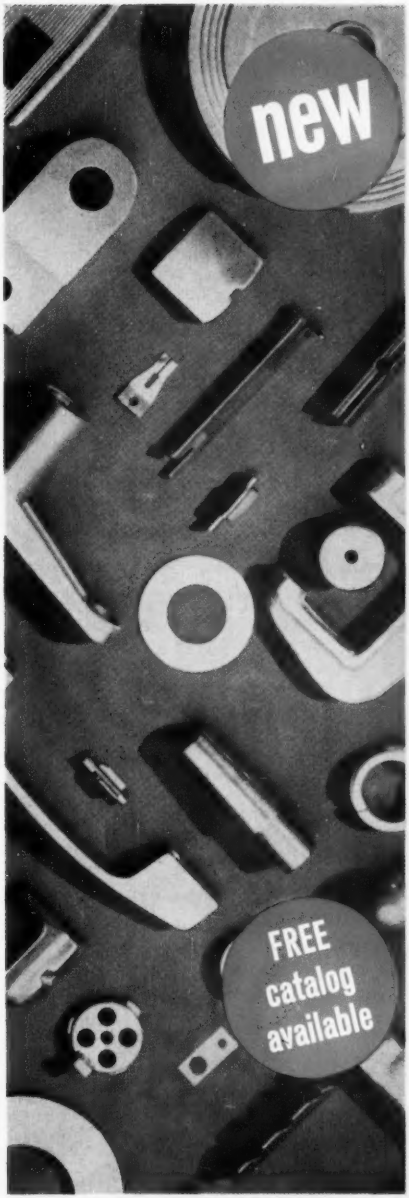
Sample: $1.50 postpaid

(INDUSTRIAL PRICE ONLY)

FLEXO Products, Inc.

Westlake, Ohio

For more data circle 354 on Postpaid Card



process for positive, low-cost deburring, grinding, polishing, burnishing, radii-forming, cleaning, descaling, rust removal, stress relief, low micro-inch finishing, and surface hardening of metal parts...

CARBOtrol 7

COST-MINDED MANUFACTURERS will find it profitable to investigate their metal finishing operations and switch to the CARBOTROL 7 barrel finishing process by CARBORUNDUM. For the first time, precision finishing of metal parts can be handled efficiently and economically by most plants to replace costly hand finishing operations. CARBOTROL 7 is adaptable to all manufacturing processes. Parts of intricate shape, fragile and large parts, and those requiring fine finishes can now be processed on a mass production basis with excellent results. A staff of trained specialists and distributors from coast to coast are at your disposal. Sample parts can be processed and proper recommendations given for finishing to absolute specifications. Look into CARBOTROL 7 today!

for a complete, unbiased national service... count on

CARBORUNDUM®

Electro Minerals Division
Dept. PF 83-04
THE CARBORUNDUM COMPANY
Niagara Falls, N. Y.

Please send me your booklet "Carbotrol 7 Process of Precision Barrel Finishing."

Name _____

Title _____

Company _____

Address _____

City _____ Zone _____ State _____

For more data circle 355 on Postpaid Card

DeVilbiss Trailer-Mounted Air Compressor: enough pressure for airless spraying

600; displacement, 20.86; delivery, 13.5 c.f.m. at 125 lbs., 15.0 c.f.m. at 80 lbs.

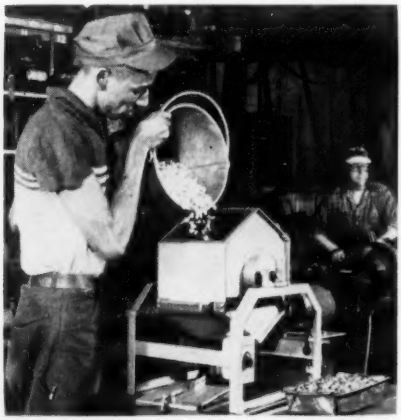
Manufacturer: The DeVilbiss Co., Toledo 1, Ohio.

For more data circle 11 on Reader Service Card

Small Tumbling Machine

An economical tumbling machine introduced by Chicago Wheel and Manufacturing Company is designed

(continued)



Handee Slide-Abrader: for small parts

Pickling Problems?

A broad line of CLEPO powdered pickling compounds is available to reduce the hazard, corrosion, fume, spray and storage problems encountered with raw acid cleaners.

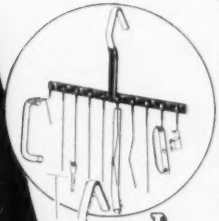
An experienced metal finishing sales engineer works with you in each application to insure top CLEPO performance.

Frederick Gumm Chemical Company maintains customer service research laboratories where samples are processed and unusual problems are studied scientifically. This service is available to you at no cost.

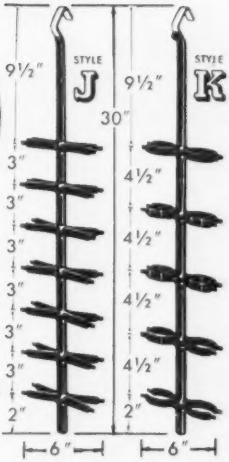
FREDERICK GUMM CHEMICAL COMPANY INC.
538 Forest Street, Kearny, N. J.

For more data circle 356 on Postpaid Card

New, Ready Made Mass-produced Economy Plating Racks



STYLE L
7⅜
$4.50



STYLE M
9"
Insulated "S" Hooks

¼" copper rod
heavy plastisol coat
Less than 100, $.45
100 or more .40
available in ⅛" rod.

$2.45

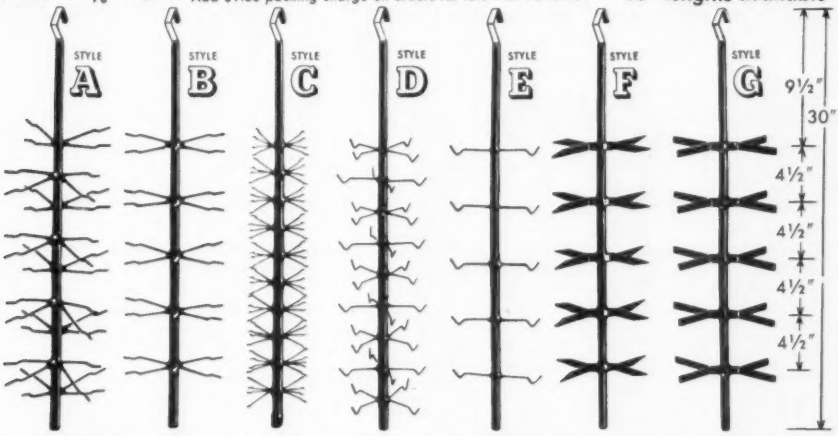
Straight .093 dia. phosphor bronze wires; 8" long, 1½" centers. Wires easily shaped or shortened.

8¼
14½

Tips 1/16x1/2" $6.50
Tips 1/16x1/2" $5.75

36" lengths available

Add $1.50 packing charge on orders for less than 12 racks.



Spines one-piece solid copper round cornered and sand blasted. Tips phosphor bronze, riveted to spine and soldered when necessary for complete rigidity. Coated after assembly with BELKE Universal Plastic.

Belke MANUFACTURING COMPANY
947 Cicero Ave., Chicago 51, Ill.
EVERYTHING FOR PLATING PLANTS

For more data circle 357 on Postpaid Card

for use in screw machine shops, machine shops, die casting and stamping departments. Weighs only 64 pounds, has timer that cuts off power after cycle is complete. Details in Bulletin S-90, available from the manufacturer.

Manufacturer: Chicago Wheel & Mfg. Co., 1101 W. Monroe St., Chicago 7, Illinois.

For more data circle **12** on Reader Service Card

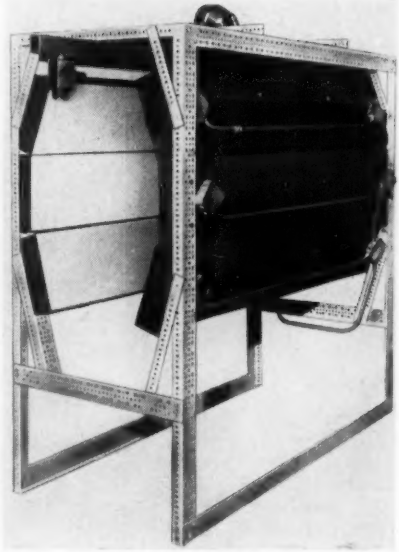
★ ★ ★

Modular Infrared Ovens

Modular infrared ovens that can be used with any conveyor are now available from Infra Red Systems, Inc.

The basic module of these ovens is called RediRay. It consists of a self-contained heater which uses a ceramic face as a source of infrared radiation. The ceramic face is brought up to emission temperature by resistance wire embedded in an insulating block

(continued)



Infra Red Systems' Modular Oven

CRES-LITE
BRONZE POWDERS
are Pure, Brilliant, Metallic, Bronze!
* and you can tell

* by the brilliant sheen and full-bodied lustre!
* by the greater coverage—at less cost per square inch of finished product.

Unequalled for smoother, more brilliant Plated-Effect Finishes—by spray, dip or flow coating.

IN STOCK—tremendous selection of colors including popular metallic pastels, statuary and antique shades.

COLORS MATCHED—with no variance in quality, color or lustre from batch to batch. Fast service guaranteed.

SPECIAL COLORS—Over 25 years experience in creating special colors and shades for the plastic and metal finishing trades. Satisfaction assured.

NEW COLOR CARD
Just Off the Press—FREE!
You haven't seen anything until you've seen this full range of colors—for immediate delivery.

CRESCENT BRONZE POWDER CO.
118 W. ILLINOIS STREET, CHICAGO 10
1841 S. Flower St., Los Angeles 15

For more data circle 358 on Postpaid Card

CLEARING THE WAY FOR PROGRESS

Quality is a Built-in Component. That's why CATERPILLAR TRACTOR CO. has used PREP PRODUCTS continually for 22 years.

METAL CONDITIONING—RUST REMOVING
PHOSPHATING—CONVERSION COATING
PAINT BONDING—CLEANING

You too will get better results with this supreme line!

Write Today for Literature. Give Details!

PREP
PRODUCTS AND PROCESSES

METALPREP
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LYFANITE
PHOSTEEM
PREP-N-COTE
EMULSOPREP
STRIP-PREP
RINSEPREP

AND OTHER PREP PRODUCTS FOR STEEL, ALUMINUM, ZINC, CADMIUM, ETC.

NEILSON CHEMICAL CO.

Windsor, Ontario — 2302 Gainsboro, Detroit 20 (Ferndale), Michigan — Los Angeles, California

For more data circle 359 on Postpaid Card

back of it. The entire heating block is backed up by alternate layers of batt and reflective insulation. All are mounted in a sheet metal shell.

The RediRay oven allows radiant energy which does not strike the work to be absorbed by the module directly opposite and thereby reduce the power necessary to maintain proper radiation temperature. This regenerative principle has resulted in exceptionally high efficiency for RediRay ovens, the manufacturer says.

Temperature is controlled by a voltage control. Units are available with up to 2000 watts per sq. ft. radiation.

Manufacturer: Infra Red Systems, Inc., 240 Route 23, Riverdale, N. J.

For more data circle **13** on Reader Service Card

★ ★ ★

Buffing Machine

A straight-line buffing and polishing machine for high - production light-duty applications has been introduced by Acme Manufacturing Company. The machine is recommended for use in finishing such parts as nameplates, door handles, drawer pulls, channel extrusions, small moldings, hinges, cigarette lighter bodies, refrigerator shelves and ornaments.

Adjustable lathes may be positioned around the machine for tangent or wide-wheel, cross-cut buffing operations. Acme polishing heads and abrasive-belt arm attachments can be applied for strapping and contact wheel polishing - type operations.

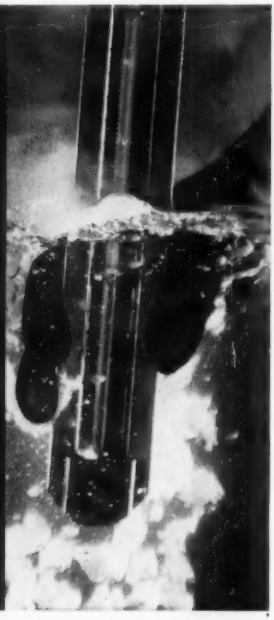
The machine consists of a 10-

(continued)

For Extra Comfort in Hot and Cold Liquids

Stanzoil NL-34

by **PIONEER**



Knit-Lined Gloves for Greater Comfort — Elastic knit cotton lining absorbs perspiration, slips on easily, insulates from heat and cold.

Tough Neoprene Coating — Resists abrasion, oils, acids, caustics, solvents, greases.

Curved Snug-to-Tip Fingers — Designed to fit the shape of hand naturally, comfortably.

Non-Slip Grip — For a safer-than-bare-hand grip.

Send for PIONEER's *FREE* "Foolproof Glove Selector"

The PIONEER Rubber Company (NL-34)
285 Tiffin Road, Willard, Ohio

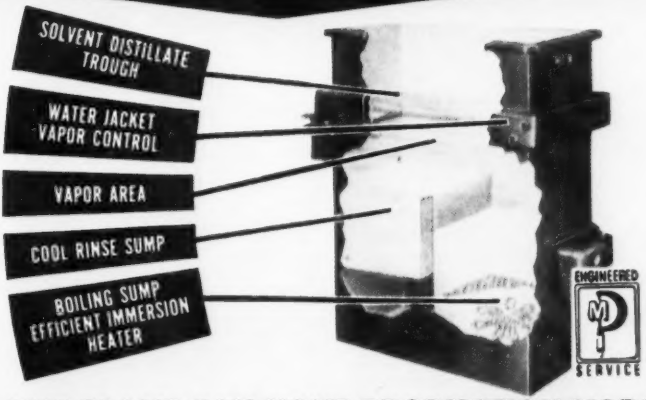
Gentlemen:
Please send me:

☐ New "Foolproof Glove Selector" by PIONEER
☐ 1960 PIONEER Industrial Glove Catalog
☐ 17" x 22" Full Line Glove Wall Chart

Firm _____
Address _____
City _____ Zone ___ State _____

For more data circle 360 on Postpaid Card

this COMPACT, VERSATILE DEGREASER proves ideal for efficient, economical production in smaller plants or departments



NOW ANY PLANT CAN HAVE PRODUCTION VAPOR DEGREASING FOR LESS THAN $400.00

This vapor degreasing economy may be just what you're looking for. With such a low original investment it is possible for every plant to have vapor degreasing—the *modern* metal cleaning method.

The 100 CS is a *complete* degreaser. You get cool and hot rinse, along with vapor degreasing. In addition, the 100 CS also operates as a solvent recovery still at seven gallons per hour. (This rate is based on a 30% contamination of solvent).

The Phillips 100 CS operates economically on either a *continuous or intermittent basis, handling many production or maintenance jobs quickly and inexpensively.* Check into this low cost unit today.

SEND FOR COMPLETE TECHNICAL DATA

All essential information on 100 CS specifications and electrical characteristics.

ASK FOR DETAILS ON OUR NEW LEASE-PLAN FOR VAPOR DEGREASERS

Phillips *MANUFACTURING COMPANY*
3457 West Touhy Avenue
Chicago 45, Illinois

STANDARD and HEAVY DUTY ELECTRIC, STEAM, and GAS, VAPOR DEGREASERS
POWER AND SURGE WASHERS • SPECIAL CLEANING EQUIPMENT

For more data circle 361 on Postpaid Card

TRUE BRITE BRASS SOLUTION

A foolproof solution which has been in use for over 6 years in light and heavy production.

- Ready To Use — Just Add Water
- No Variance in Color
- Trouble-Free — Little Supervision Needed
- Low Cost — Additions only once a day

Available in a variety of colors. Will match your sample.

Write for technical bulletin and prices.

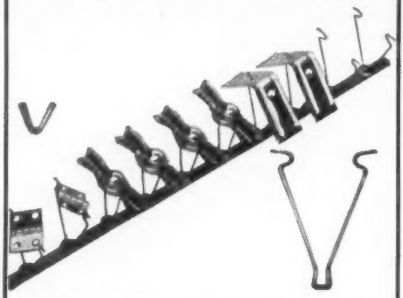
TRUE BRITE CHEMICAL PRODUCTS CO.
Box 31, Oakville, Conn.

For more data circle 362 on Postpaid Card

VACUUM METALLIZING

We Manufacture

Racks, Spring Wire Forms, Staples and Other Accessories for the Vacuum Metallizing Trade. Shipped from Stock or Special Order.



Write for Information and Samples

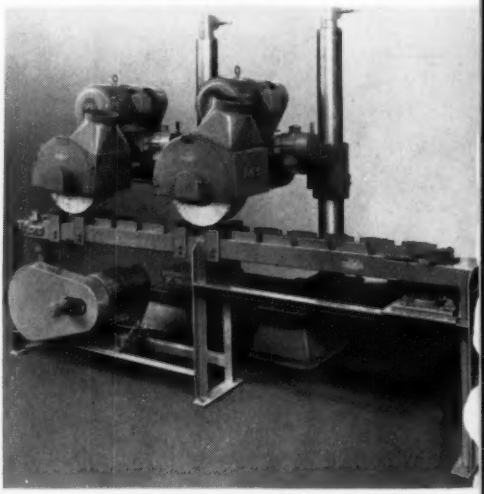
D & W TOOL & FINDINGS, INC.
52 SALEM ST. • PROVIDENCE 7, R. I.
STUART 1-4554

For more data circle 363 on Postpaid Card

inch-wide, 8-foot-long conveyor and adjustable lathes that perform the buffing operations. Additional conveyor sections can be added.

The conveyor has a chain-type drive and individual platens that carry the work-holding fixtures. A ¾-h.p. motor drives the conveyor through a variable-speed drive that provides speeds of 10 to 30 f.p.m. Loading and unloading are carried out at one end.

The platens can be of either horizontal or follower-return type. This means that the part traveling on the return side of the conveyor can face in either the same or the opposite direction as those on the in-feed side.



Acme Jr. Straight-Line Polishing and Buffing Machine: for high-production, light-duty.

Manufacturer: Acme Manufacturing Co., 1400 E. Nine Mile Rd., Detroit, Michigan.

For more data circle 14 on Reader Service Card

★ ★ ★

Pink Quartz Tumbling Media

A pink quartz (Type "Q" medium) barrel finishing media has proven in

(continued)

NOW! A SYNTHETIC MORE BRILLIANT THAN NATURAL PEARL ESSENCE

It's true! Nacromer Z provides far brighter lustre than is possible with either natural pearl essence or any other synthetic, yet, it sells for half the price of the better grades of natural essence. Applied by brush, spray, or dip, Nacromer Z will add new beauty to your wood, metal, plastic, glass and other products. And, because it provides greater coverage, Nacromer Z is more economical to use.

If you use pearl essence, or contemplate using it, Nacromer Z is worth seeing. Use the coupon below.

NEW 8-PAGE NACREOUS PIGMENT HANDBOOK

This valuable guide to the use of natural pearl essence and synthetic pearl pigments is yours for the asking.

THE MEARL CORPORATION 41 EAST 42nd STREET, NEW YORK 17, N. Y.

☐ Send a sample of Nacromer Z for use with _____ (coating vehicle)

☐ Send us the 8-page Handbook

NAME.....

COMPANY.....

ADDRESS.....

.....

THE MEARL CORPORATION 41 EAST 42nd STREET, NEW YORK 17, N.Y.

For more data circle 364 on Postpaid Card

tests to be harder than other types of quartz, according to Techline Division of Wheelabrator Corporation.

This media is processed into shapes predominantly cubical rather than random shapes. Cubes are said to reduce problems of lodgement when intricately-shaped parts are being finished.

The Type "Q" media is finer textured and its smoothness of surface permits its use in burnishing, substituting for steel balls, Techline reports. It is available in a full range of sizes from 00 through 6.

Manufacturer: Techline Division, Wheelabrator Corporation, 1155 Avenue V, Vicksburg, Mich.

For more data circle **15** on Reader Service Card

★ ★ ★

Ultrasonic Cleaner

An ultrasonic cleaner for applications requiring average energy levels has been announced by National Ultrasonic Corporation.

Model 160 in the company's Standardline, the unit has a 13-gallon stainless steel tank. The tank is 22 inches in length, 16 inches wide and 10 inches deep. It has rounded corners to facilitate the rinsing out of contaminants removed by ultrasonic energy. 30 per cent of the tank bottom is covered with crystals. Actual radiating surface is 96 square inches.

The 115-volt a.c. single-phase 60-cycle generator is designed for continuous operation. It delivers an average power output of 500 watts and produces peaks of 2000 watts. Unit has one-tube

(continued on page 101)

MOISTURE-FREE SURFACES in 1/2 THE TIME!

Model 20 New Holland KREIDER Centrifugal Dryer

Air-dries . . . as it Spin-dries! Eliminates scoring and marring . . . speeds up production . . . cuts down on rejects!

SPECIFICATIONS:

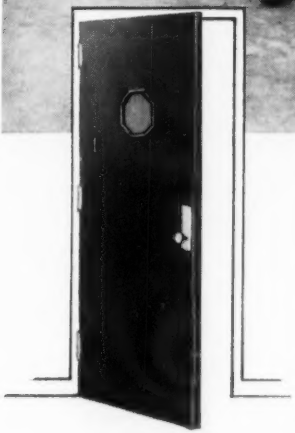
1-h.p. motor—220, 440, 550 volts—2 or 3 phase. Spins 75-lb. loads at 825 r.p.m. Quiet V-belt drive. Arc-welded steel plate construction. Weight 490 lbs. Requires minimum floor space. Meets N.E.C. specs. Auxiliary electric or steam heating units available as optional equipment.

Send for illustrated 4-page folder. Write Dept. F-360

NEW HOLLAND MACHINE COMPANY
NEW HOLLAND, PA.

For more data circle 365 on Postpaid Card

Here's how TRUSSBILT . . . opened the door to improved quality in metal finishing operations



The TRUSSBILT DIV. of Siems Bros., Inc., St. Paul, Minn. . . . a leading manufacturer of flush steel doors used throughout the world; recently installed a tandem set-up of Timesaver "Speedbelt" Sanders in their steel door finishing line. Using a Model TOP and Model SPL, both face sheets of the doors are given a rough finish on the first pass through the line.

Low spots are then filled and doors are put through the line a second time for finishing. This provides a tremendous production advantage over previous hand operated methods, while eliminating variations in finish quality. The Timesaver line can handle approx. 100 doors an hour. This high speed finishing operation precedes dipping and baking operations, efficiently removing weld blemishes, while lowering high spots and smoothing out filled in valleys.

TRUSSBILT's experience is typical of Timesaver "Speedbelt" installations throughout the country . . . where the needs for better quality, better production and lower units costs is important. You, too, can enjoy the advantages of wide abrasive belt finishing and polishing in your shop at a minimum of cost. Investigate the advantages of Timesaver "Speedbelt" Sanders for your metal finishing and polishing operations, now!

TIMESAVER SANDERS

Write Today . . .

Send for literature and prices . . . or request an analysis of your finishing problem. No obligation.

Dept. Q-23
Box 7446 • Robbinsdale Station
Minneapolis 22, Minn.

For more data circle 366 on Postpaid Card

WHY PAY FOR MORE RECTIFIER THAN YOU NEED?

Now, H-VW-M takes the costly confusion out of rectifier design, by reducing *hundreds* of variations — in diodes, protective devices and controls — to *four basic models*, standardized to meet *specific* needs. You save on initial cost *and* on maintenance! Here are the four basic H-VW-M rectifier types, and some of their important features . . .

1. The H-VW-M General Plating Step Control Rectifier

Uses only *one* transformer, not the usual two. Result: high efficiency, lower price. And, H-VW-M has *doubled* the average control accuracy, offering *44 steps* instead of 22.

2. The H-VW-M Barrel Plating Rectifier

This exclusive H-VW-M design uses only the *top-half* of the voltage range — the range you need for higher-voltage barrel processing. You get a high power factor unit with precise 22-step control, and can save as much as 5% on purchase price alone!

3. The H-VW-M Anodizing Rectifier

Automatic surge protection is a *built-in feature* of this specialized design: you can simply set it, and forget it!

4. The H-VW-M General Plating Automatic Stepless Control Rectifier

Unit offers accurate control to 1% of setting. Reliable and sturdy — built to rugged steel-mill requirements for low maintenance costs.

Find out more about all four basic types of H-VW-M *Standardized* Rectifiers, offering many exclusive features and advantages — including complete protection systems. Write today to:

Hanson-Van Winkle-Munning Company, Matawan, New Jersey • Offices in Principal Cities.

Alert Supply Company is H-VW-M in the West, Los Angeles • San Francisco.

H-VW-M

Progress in metalfinishing through advanced processes • equipment

For more data circle 367 on Postpaid Card

About other H-VW-M electrical equipment

NOW — GENERATOR BRUSH OVERLOAD ELIMINATED

A new H-VW-M Equaload Brush makes overloading impossible. Result: Commutators can now last the life of generators – without resurfacing.

A braided nickel shunt on the new Equaload Brush completely eliminates unequal current distribution because nickel's resistance to current flow increases proportionately with temperature rises.

When any brush accepts more than its proportional share of current, the temperature of the shunt rises, its resistance increases and current is immediately distributed equally among the other brushes.

Use of a braided nickel shunt is *exclusive* with H-VW-M. The new H-VW-M Equaload Brush is designed to fit all makes of DC generators.

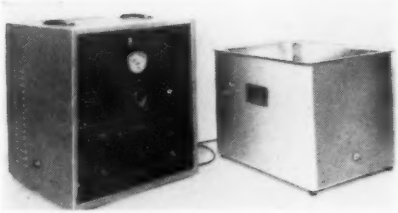
H-VW-M Form "A" Tank Rheostats – Designed to eliminate all switch failures caused by excessive heating. Standard sizes available with ratings from 30 to 1000 amps. Larger sizes to 5000 amps can be furnished.

H-VW-M Universal Carbon Pile Tank Rheostats – Provide continuous voltage control from fixed plating line voltage source in ranges to 250 amps, 6 to 12 volts.

H-VW-M Motor Generator Sets – Available up to 50,000 amps. Standard voltage ratings are from 6 to 250 volts.

H-VW-M H-VW-M H-VW-M

For more data circle 368 on Postpaid Card



National Ultrasonics' Model 160: for producing average levels of ultrasonic energy

oscillator, front-panel switching which permits a choice of either of two transducers, forced-air cooling and 3-wire ground protection.

Manufacturer: National Ultrasonic Corporation, 111 Montgomery Ave., Irvington, N. J.

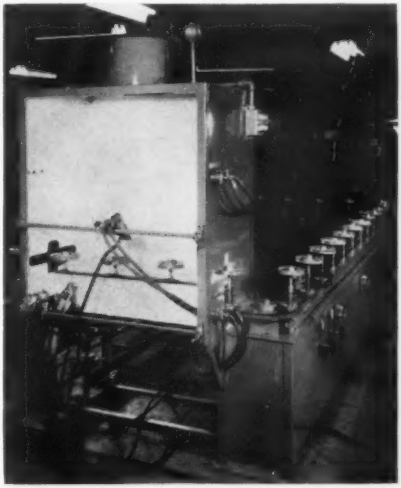
For more data circle 16 on Reader Service Card

★ ★ ★

Special Spray-Painting Machine

A special machine which adapts the chain-on-edge principle to convey parts through an automatic spray

(continued)



Special Spray Machine: uses the chain-on-edge principle to carry parts through

finishing operation has been introduced by the Conforming Matrix Corp.

One version of the machine (see cut) was tailored to fill the needs of a producer of pulleys, but that purpose is but one of many which can be fitted to the user's requirements.

The machine can be equipped with spray guns to paint from above and/or beneath, continuously or "skip-spray." Any number of workholders from a minimum of 15 can be supplied on centers to suit size of part, loading and drying time. The chain employed is rigid roller or conveyor chain.

The machine is equipped with a variable-speed drive on the conveyor and can be equipped with variable speed drive to revolve the part being painted.

Manufacturer: Conforming Matrix Corporation, 356 Toledo Factories Bldg., Toledo 2, Ohio.

For more data circle **17** on Reader Service Card

Cleaning Compound

An alkaline cleaning compound for use in spray washing operations (developed by DuBois Co.) is especially compounded for use on metals where hard water spotting and lime deposits are a problem and where the user wants to disperse pigmented drawing compound. Called "422," the product reduces the need for pre-soaking or other auxiliary cleaning, in addition to stopping streaking on washed work.

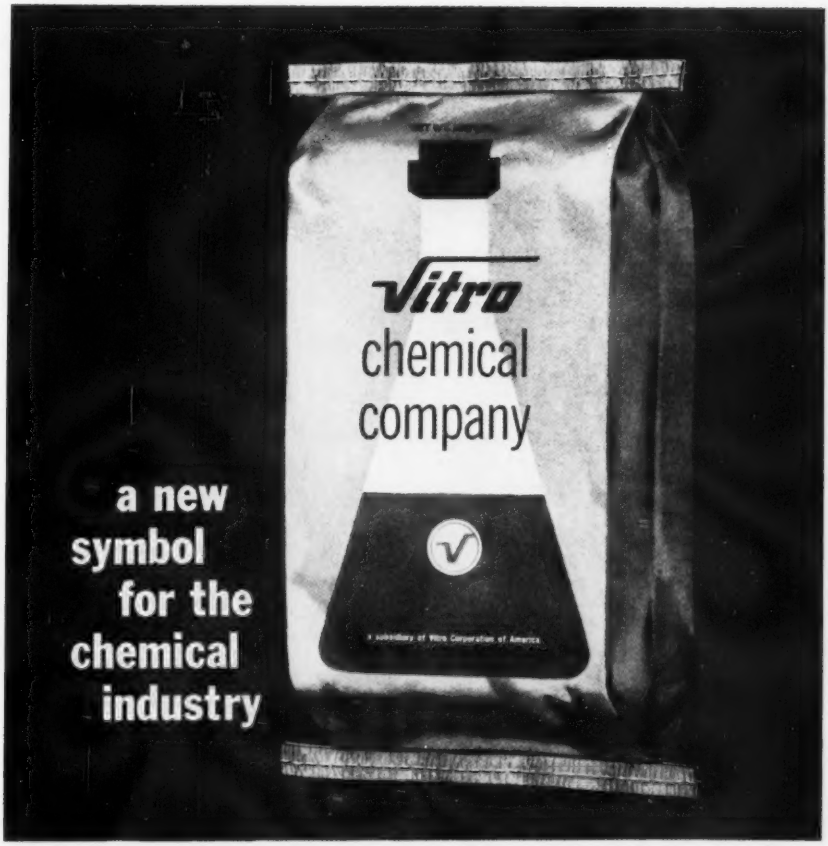
DuBois product researchers say "422" actually makes water hardness work for you, not against you. It retards the rusting of washed parts and is safe on aluminum, tin and most other soft metals. There is no danger of alkaline carry-over into the phosphatizing stage, DuBois laboratory men say, because it rinses completely.

Manufacturer: The DuBois Co., Inc., 1120 W. Front St., Cincinnati 3, Ohio.

For more data circle **18** on Reader Service Card

Rhodium
ELECTROPLATING
SOLUTIONS
SINCE 1901
Consult our staff about plating problems.
Rhodium, hard and very corrosion-resistant, is an excellent electrical contact material.
Its use is suggested on printed circuits, wave guides, and electrical contacts where light contact pressures, low voltage, and intermittent service are involved.
This Rhodium plating solution is easy to use. It operates over a wide range of temperature and current densities. We will be glad to plate samples without charge.
SIGMUND COHN MFG. CO., INC.
121 SOUTH COLUMBUS AVENUE · MOUNT VERNON, NEW YORK

For more data circle 369 on Postpaid Card



Co · Cu · Ni · U · V · Zr salts / rare earths / thorium products

The integration of three companies* into a single, unified operation enables us to offer customers service of an organization that includes • **advanced research** • **application-tested quality** • **experienced technical service.** Coupled with this know-how is reliable delivery. Vitro chemicals already lead in these industries...glass and ceramics • metal finishing • metallurgy • nucleonics • catalysis • fine chemicals.

As part of the Vitro family — companies active in new areas of industrial technology — we invite your suggestions and inquiries on new chemical products.

Find out how Vitro quality can fit your production. For technical and price information, write Vitro Chemical Company, Dept. N, 630 Third Avenue, New York 17, N. Y.

*Heavy Minerals Co., Vitro Rare Metals Co., Vitro Uranium Company

Vitro CHEMICAL COMPANY
a subsidiary of Vitro Corporation of America

GENERAL SALES OFFICES
261 MADISON AVENUE, NEW YORK 16, N. Y.

inorganic chemicals and metals

Co Cu Ni Th U V Zr
rare earths

For more data circle 370 on Postpaid Card

All-Purpose Liquid Cleaner

A multi-purpose liquid compound that can be used for almost any conceivable industrial cleaning operation has been introduced by Turco Products, Inc.

Called Turco Plaudit, the product is currently being successfully used for such operations as steam cleaning, emulsion cleaning, immersion cleaning, ultrasonic cleaning and wipe-on cleaning.

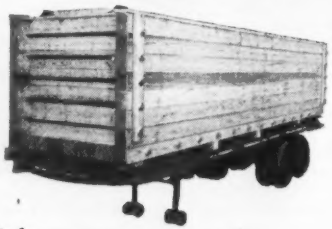
Mild and neutral Plaudit is safe on hands, painted surfaces, upholstery and other easily damaged surfaces.

It is powerful enough to quickly and completely remove the heaviest soils found on road building equipment, parts transfer cases, drilling equipment and other hard-to-clean surfaces, Turco reports.

Manufacturer: Turco Products, Inc., 24600 S. Main St., Wilmington, Calif.

For more data circle **19** on Reader Service Card

BIG TANKS
. . . or small
to fit *your* needs



Made to meet *your* requirements . . . from only the finest woods. Over 90 years experience. Get free estimates.

WOOD TANK DIVISION

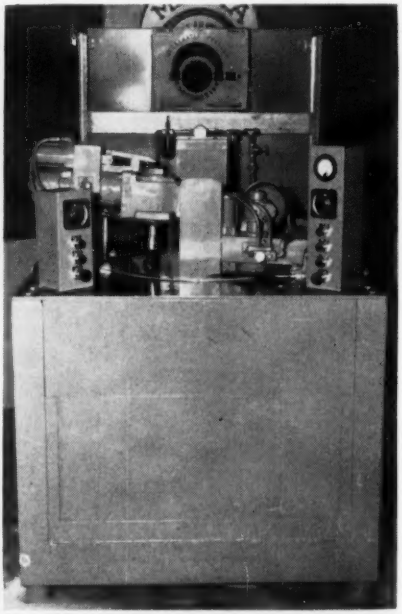
Kalamazoo TANK & SILO CO.

1571 Harrison Street, Kalamazoo, Michigan

For more data circle 371 on Postpaid Card

Loose-Abrasive Finisher

Mecha-Finish Corporation has introduced the MM-2-High-Speed Model No. 3000, a two-spindle unit which has been designed for low production of several different parts and/or high



Mecha-Finish Model No. 3000: for finishing spindle-mounted parts in loose abrasives

production of a single component. It has two independently operated spindle heads, which allows the machine operator to service one spindle while the opposite spindle is in process.

The parts are mounted on air-operated spindle fixtures. These fixtures are submerged while rotating in a fluid abrasive mass which simulates a form-fitting grinding wheel, regardless of the shape of the part. Surface of the part travels at the rate of approximately 2000 s.f.m.

A No. MM-2-HS-3000 Mechamatic Machine operating on a 15-second

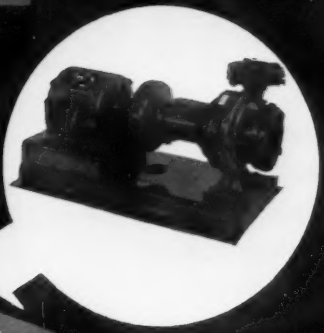
(continued)

For more data on advertisement on opposite page, circle 372 on Postpaid Card

QUALITY PRODUCTS

require

QUALITY FINISHES



CLINCO

SYNTHETIC ENAMELS

BELL & GOSSETT is one of the world's leading manufacturers of hot water heating specialties, air conditioning and refrigeration equipment, pumps, heat exchangers and other products. The Company has established an enviable reputation for quality and for value.

For over 20 years BELL & GOSSETT has purchased Clinco Red Enamels and Gray Hammers. They appreciate Clinton's dependable service and insist on a quality finish for a quality product.

THE CLINTON COMPANY

PIONEERING QUALITY INDUSTRIAL FINISHES SINCE 1928

1220 ELSTON AVE. • CHICAGO 22, ILL. • Phone: ARmitage 6-7760

time cycle will produce 240 pieces per hour at 100 per cent efficiency. The machine will handle parts up to 6 inches in diameter.

Manufacturer: Mecha-Finish Corporation, Sturgis, Mich.

For more data circle **20** on Reader Service Card

★ ★ ★

Aluminum-Treatment Chemicals

Mitchell-Bradford Chemical Co. has introduced three products for treatment of aluminum: Aluminum Etch No. 22, Al-Smut Remover, and Cleaner No. 20.

Aluminum Etch No. 22 is a free-flowing salt mixture which is dissolved in water to make a solution for etching aluminum and its alloys. Produces fine or deep etch, depending upon concentration, immersion time and temperature. Forms no scale, has low dragout rate, operates at various temperatures, concentrations.

Al-Smut Remover forms a solution that removes smut from most types of aluminum (smut is formed during etching and cleaning operations). Also deoxidizes and brightens aluminum. Used at room temp.

Cleaner No. 20 is a non-etching aluminum cleaner. Adequately buffered to ensure high activity and long life; inhibited to prevent etching. Rinses easily, cleans well. Operates at 160-190 deg. F.

Descriptive bulletins available from the manufacturer.

Manufacturer: Mitchell - Bradford Chemical Co., Wampus Lane, Milford, Conn.

For more data circle **21** on Reader Service Card

VIBRA-WASHER

. . . THE COMPLETELY NEW AUTOMATIC PARTS WASHER AND METAL CONDITIONING MACHINE

- **Labor saving**
- **Automatic unloading**
- **For single or multi-stage operations**
- **No nesting of parts during cleaning or conditioning cycle**
- **Adjustable capacities to 10,000 lbs. per hour**

The versatile new Simplicity VIBRA-WASHER, revolutionary machine for washing and conditioning of small metal parts, stampings and castings, employs a vibrating work carrier that automatically conveys parts through cleaning or conditioning bath. Solution is forced around parts, even into blind drillings and slots. In single stage, VIBRA-WASHER removes chips, oil and grease quickly . . . economically. In multi-stage, several units in line will provide cleaning, rinsing and phosphating, eliminating "between-stage" handling. Write today for Bulletin 107, to: Industrial Washer Division.

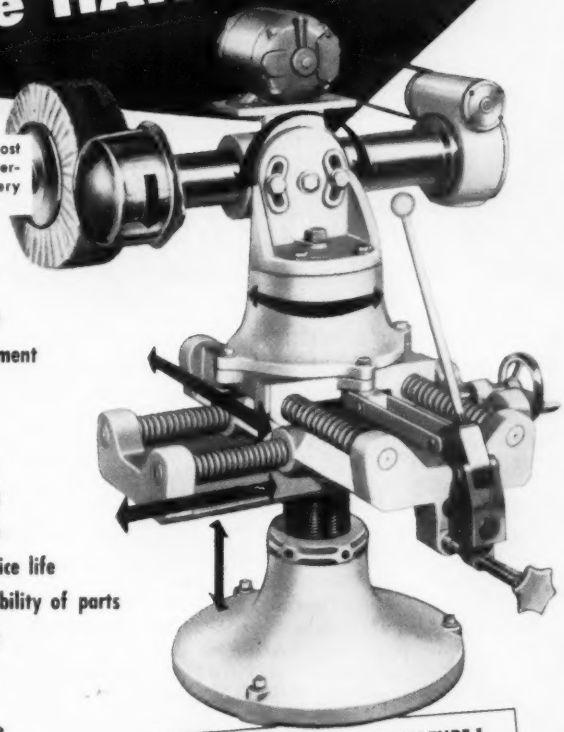
Simplicity
TRADE MARK REGISTERED

212 **ENGINEERING COMPANY • DURAND 25, MICH.**

For more data circle 373 on Postpaid Card

NOW!

Handle 95% of your BUFFING, GRINDING, or DEBURRING jobs with one piece of equipment ... the HAN-D-MATIC



A Murray-Way engineered, low cost basic machine with standard, interchangeable components for every work shape and size.

HAN-D-MATIC gives you —

- Top quality equipment
- Low equipment investment
- Unlimited versatility
- Increased output
- Lower production cost
- Uniformly better work
- Minimum maintenance
- Long, dependable service life
- Complete interchangeability of parts
- Reduced work hazards
- Less operator fatigue

WRITE FOR DETAILED LITERATURE !

MURRAY WAY

MURRAY-WAY CORPORATION

P. O. BOX 180, MAPLE ROAD EAST • BIRMINGHAM, MICH.

For more data circle 374 on Postpaid Card

DIRECTIONAL CENTRIFUGAL ATOMIZATION

GYROMAT CENTRIFUGAL ELECTROSTATIC SPRAY SYSTEMS SAVE 50% IN COATING MATERIALS ALONE

Here's a spray process that gives your product an economical but *superior* and uniform finish! Gyromat's centrifugal spray system, combined with an electrostatic field, gives you maximum material efficiencies, gets into recesses that give other electrostatic sprays real trouble, and permits "wrap around" spraying, too!

The head directs a controllable atomized tangential fan that blends out at each end — gives perfect "match-in" on large areas when a multiple-head set-up is used. Heads are easy to adjust to produce the directional fan you want — from 0° to 360° — and can be positioned and sprayed in any attitude!

The process puts virtually *all* your coating material on your product — uniformly, safely, and at high speed!

An "Automatic Flush and Change-Over System" gives you controlled push-button clean-up and/or color change — often in less than two minutes. Some models include an automatic "skip spray" feature that eliminates the need for bunching conveyors or running a full load.

High velocity exhaust systems are unnecessary, so the Gyromat not only saves coating material, but reduces heat loss, clean-up time, and fire hazard, too!

The Gyromat process gives you out-standing material efficiency and coverage...a perfect, sales-building finish. And it can be adapted to meet any electrostatic spraying requirement. The Gyromat pays for itself — over and over — in savings, increased production, and customer satisfaction!

FOR COMPLETE DETAILS, WRITE TODAY!

THE GYROMAT CORPORATION KINGS HIGHWAY CUT-OFF FAIRFIELD, CONNECTICUT

For more data circle 375 on Postpaid Card

Cleaning-Burnishing Compound

Steel, brass or copper parts suitable for self tumbling can now be prepared for barrel plating by a simple process built around Clepo 12-K, a combination cleaning-burnishing compound, available from Frederick Gumm Chemical Company.

Clepo 12-K is added to water, the work loaded in an oblique barrel and the charge allowed to tumble for 5-30 minutes. This operation cleans and burnishes in one step. After being rinsed with clean water, parts are free of waterbreaks, lightly deburred and also burnished. These parts then require only an acid dip and rinse prior to plating.

Manufacturer: Frederick Gumm Chemical Company, 538 Forest St., Kearny, N. J.

For more data circle 22 on Reader Service Card

Compact Ultrasonic Degreaser

Model AC-25 Sonogen, built by Branson Ultrasonic Corporation, is a self-contained ultrasonic degreaser in a compact cabinet.

The unit quickly and thoroughly removes metal chips, grease, and certain insoluble soils, even from intricate parts. Components such as small motors, electronic sub-assemblies, and bearings can be ultrasonically cleaned without dismantling.

After immersion in the ultrasonic degreasing tank, work is spray-rinsed by hand, placed in the vapor zone, then removed from the unit spotlessly clean and dry.

As a guard against corrosion, all degreaser parts in contact with solvent are made of stainless steel or TFE plastic.

The degreaser has five main com-

For more data on advertisement on opposite page, circle 412 on Postpaid Card

Branson Model AC-25 Ultrasonic Degreaser: cleans intricate parts thoroughly, quickly

ponents: a 10 by 8 by 8-inch-deep ultrasonic cleaning tank; a boiling sump; an ultrasonic generator producing 40,000 c.p.s.; transducers (in the cleaning tank) that convert the electrical energy into mechanical vibrations; and a solvent-filtering system.

A variety of fail-safe features protect the unit.

Manufacturer: Branson Ultrasonic Corp., 40 Brown House Rd., Stamford, Conn.

For more data circle **23** on Reader Service Card

★ ★ ★

Versatile Polishing-Buffing Machine

A machine known as the Han-D-Matic will handle practically any buffing or grinding job in the average plant, according to the manufacturer, Murray-Way Corporation.

The machine consists of a basic pedestal and spindle unit with a wide

(continued)

AIR SPRAY WITH NO OVERSPRAY LOSS

GYROMAT LIQUID SEAL AIR-SPRAY PUTS 99% OF YOUR COATING MATERIAL ON YOUR PRODUCT

Here's an air-spray process that *eliminates material losses!* Now, if air-spraying is the best way to coat your product, there's no need to substitute less effective methods to reduce waste. The Gyromat Liquid Seal Air-Spray process automatically collects the over-spray and re-uses it!

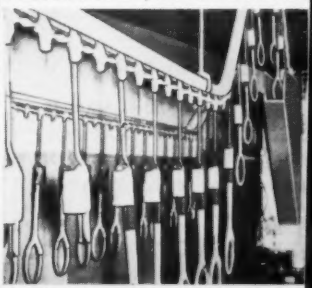
This unique process offers tremendous savings in other ways, too: it requires no exhaust system . . . eliminates heat loss, excessive house-keeping, dust "drag-in", and general fire hazard. There's no dry build-up in the chamber; just a wet film that can be cleaned up in minutes.

The process gives you *stable* air gun performance. There's no drying-out . . . no "down time" for cleaning guns. Air is partially saturated with solvent, and the movement of dry air into the chamber is minimized. (Guns may need occasional cleaning when spraying unusually heavy materials.)

The process is versatile . . . adaptable to any product for which air-spraying is the best method. You can add or remove guns in a matter of seconds to meet production needs. You can use the process as a "hot spray" system, in many cases, or as a safe, solvent-saving flow-coater. And the spray chamber can be designed to accommodate any type of conveyor.

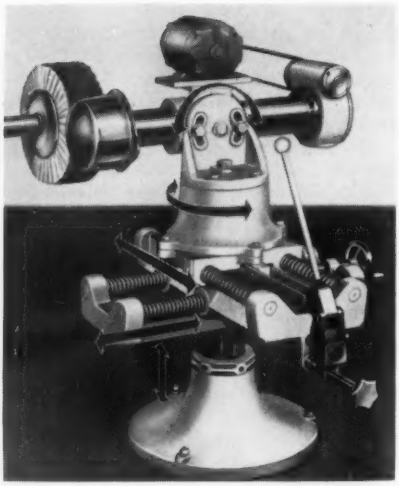
The Liquid Seal Process offers terrific savings in time and materials . . . and will give your product the finest air-sprayed finish possible!

FOR DETAILS, WRITE TODAY!



Racket frames on their way to the spray chamber for "no loss" painting by the Gyromat Liquid Seal Process.

THE GYROMAT CORPORATION KINGS HIGHWAY CUT-OFF FAIRFIELD, CONNECTICUT



Murray Way's Versatile Polishing-Buffing Machine: easy conversion for various jobs

selection of optional, interchangeable components which will accommodate workpieces of almost any shape.

The Han-D-Matic is ideal for the smaller shop where its inexpensive conversion for new jobs is an advantage. On the other hand, a large plant could use several of these versatile units with an assortment of standard components.

Manufacturer: Murray-Way Corp., P. O. Box 180, Birmingham, Mich.

For more data circle **24** on Reader Service Card

★ ★ ★

Chemical-Polishing Dip for Stainless Steel

Ox-Off Lustre Dip is a chemical-polishing bath for stainless steels of the 300 series. Levels scratches and mars, leaves a smut-free surface.

Manufacturer: Chemclean Products Corporation, 15-08 121st St., College Point 56, N. Y.

For more data circle **25** on Reader Service Card

Engineered for Unmatched Quality

ROCKWELL OVENS

Outstanding for drying or baking finishes with closely controlled heating uniformity at most efficient production rate.

Gas, electric, steam, oil-recirculation heating. Cabinet, truck, rack and conveyor types.

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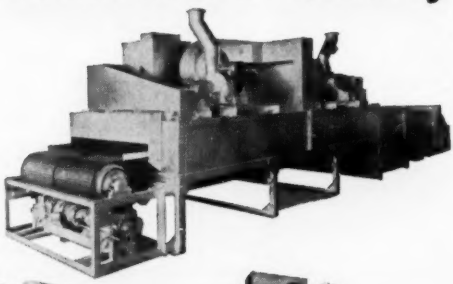
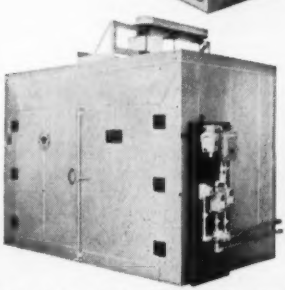
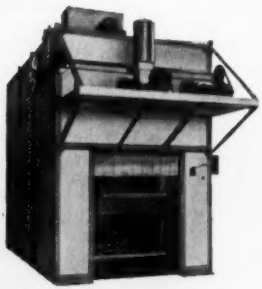
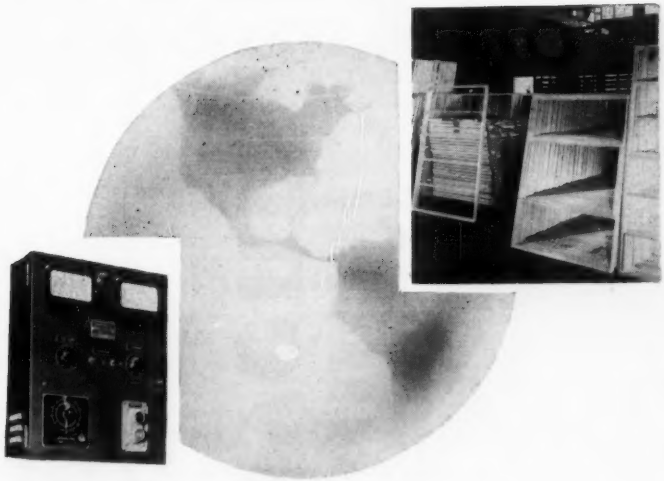






W. S. ROCKWELL CO.
2900 Eliot St.
Fairfield, Conn.

For more data circle 376 on Postpaid Card



"There's a world of difference in Anodizing when you have Automatic Current Density Control" . . .

. . . says John Gurniak of

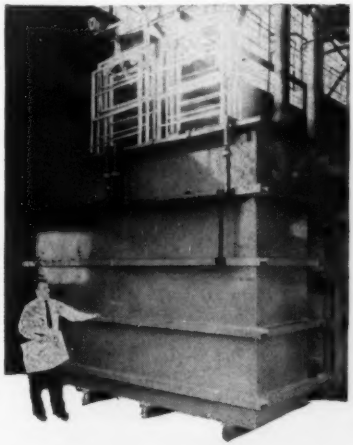
MICHAEL FLYNN MFG. CO., PA.

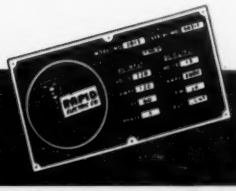
"and that big difference is the accuracy and simplicity in which a pre-determined film thickness can be controlled."

"We chose RAPID ELECTRIC'S Automatic Current Density Control rectifiers to eliminate the problem of estimating current densities with each load change. One setting, and the rectifier automatically maintains a constant current density per square foot of work."

"It's that easy"

"Once more, with the possibility of over-current virtually eliminated, MICHAEL FLYNN'S high standard of quality is assured."





THE NAMEPLATE THAT MEANS *"More Power to You!"*

RAPID ELECTRIC COMPANY

12838 Fenkell Avenue • Detroit 27, Mich. • Diamond 1-8537

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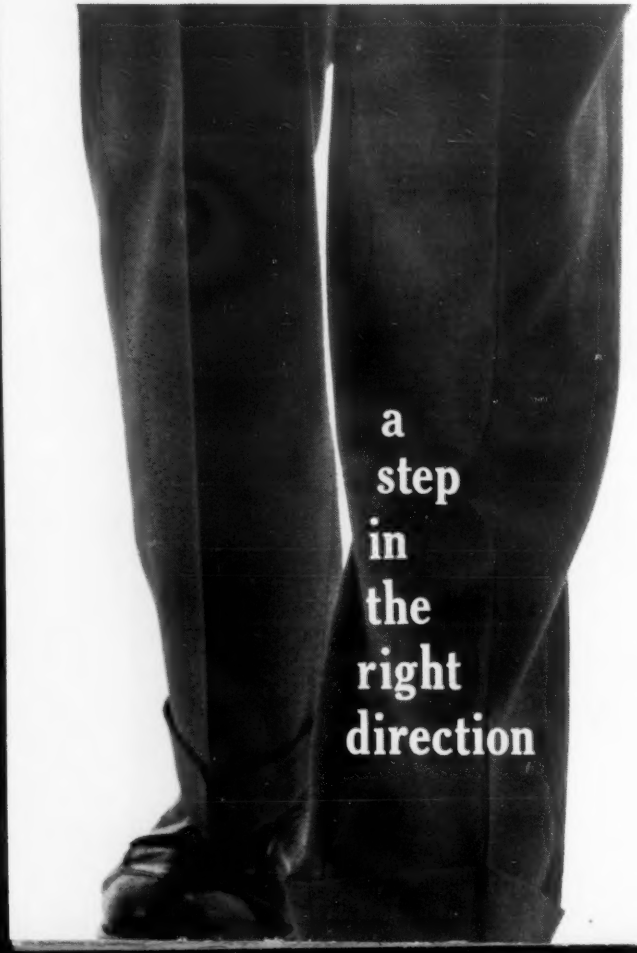

THE SOLVENTS AND CHEMICALS GROUP

sc aromatic solvents

You move a significant step ahead of competition with high solvency SC Aromatic Solvents.

Among many desirable properties, they offer a wide variation in dry times and solvencies which give them unusual versatility in your formulations. Uniformity from initial test to production is absolutely assured because SC Aromatic Solvents always start with the identical crude. Each run is carefully inspected through numerous quality-control check points until

final delivery to your plant. Call today for specific recommendations—SC Aromatic Solvents are available for immediate delivery from 21 Solvents and Chemicals Group plants and stock points in quantities to meet all your requirements.

properties of SC aromatic solvents

PRODUCT	Initial °F.	Dry °F.	Dry °C.	Flash Point °F. (Closed Cup)	Speed Evap. Min.	Kauri Butanol Value	Aniline Point °F.	Specific Gravity @ 60°F.	Lbs. Per Gal. @ 60°F.	Aromatic Equivalent Content
SC Solvent #1	211	240	116	30	2.5	86.4	+ 1	.8259	6.88	74%
SC Solvent #1-A	202	235	113	25	2.5	67	+48	.8003	6.66	52%
SC Solvent #2	270	308	153	81	14.0	80	— 2	.8418	7.01	76%
SC Solvent #2-B	277	370	188	81	21.5	75	+12	.8388	6.99	68%
SC Solvent #3	356	400	204	135	64.0	72	+24	.872	7.26	69%
SC Solvent #28	329	379	193	122	51.0	73	+14	.8597	7.16	74%
SC Solvent #100	321	351	177	115	21.0	93.2	—37	.8708	7.25	96%
SC Solvent #150	369	412*	211*	152	98.0	91.8	—26	.8899	7.41	96%
SC Solvent #450	450	588*	309*	212	750	73	+10	.9279	7.73	

*End Point

WRITE FOR YOUR COPY of The Solvents and Chemicals Group ORGANIC SOLVENTS HANDBOOK. Contains definitions, various evaluation methods, applications, etc. Thousands in use throughout the country.

SC Solvents Chemicals Group Member

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For more data circle 378 on Postpaid Card

Cleaner-Paint Stripper

DuBois Co. has introduced a stripper that removes chemically resistant synthetic resin finishes. Called "Super Strypp," it penetrates and alters the paint resins, lifting them from metal surfaces. The product is especially effective on acrylics, modified epoxies and heavily pigmented paints. It also removes the film frequently left by ordinary alkaline paint strippers.

Super Strypp also has solved the problem of removing pigmented drawing compounds and heavy soils.

Manufacturer: DuBois Co., Inc., 1120 W. Front St., Cincinnati 3, Ohio.

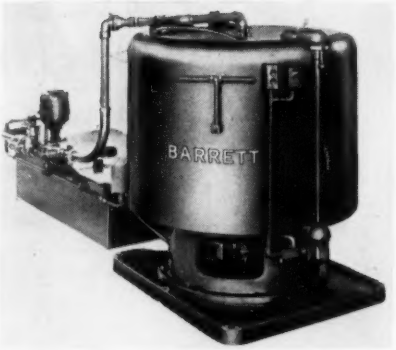
For more data circle **26** on Reader Service Card

★ ★ ★

Impregnator

An impregnator developed by the Leon J. Barrett Company quickly impregnates such parts as capacitors, armatures, yarns, electrical coils and other porous and semi-porous objects.

The Barrett Impregnator utilizes centrifugal impregnation by developing a pressure variance from 100 p.s.i. at the periphery to zero at the center of the chamber.



Barrett Impregnator: uses centrifugal pressure

Saturants such as varnish, wax, asphalt, oil or others are pushed into the objects while air and other con-

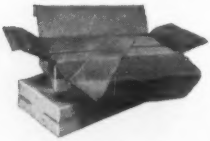
(continued)

For Dust Free Finishes!

BOND TACK CLOTH

In ROLLS

Cut off any size piece to use as needed.



IN BULK

Cut and folded. Ready to use.

STAYS SOFT AND TACKY — A SPECK-FREE FINISH EVERY TIME

Now Available In Rolls or Cut Bulk—White or Gold In Four Different Types of Cloth

Get your Tack Cloth packed just the way it's easiest for you to use . . . either in 150 yard rolls of 36" wide cloth or in handy cartons . . . 100 or more Tack Cloths to the carton.

No matter which way you buy it, you can be sure that every square inch will stay SOFT and TACKY until the very last bit is used up! Choice of Standard, Extra Tacky or Less Tacky, as desired.

The Cut Bulk size is 18" x 36" . . . folded to 4½" x 18" or 9" x 18" for ease of handling. ALL BOND TACK CLOTH is *Spontaneous Combustion Proof, Lint-Free and Wax-Free.* Gives a sparkling speck-free Finish *every time.* Clean and Sanitary. No waste.

TRY THEM and COMPARE RESULTS. Samples Gladly Sent Upon Request.

"The Tacky Wiper Specialists"

Bond® **CHEMICAL PRODUCTS CO.**

2639 N. CLYBOURN AVE. CHICAGO 14, ILLINOIS

ALSO INDIVIDUALLY PACKED IN GLASSINE ENVELOPES —144 to the Carton

A WARRANTY OF SATISFACTION IN EVERY CARTON

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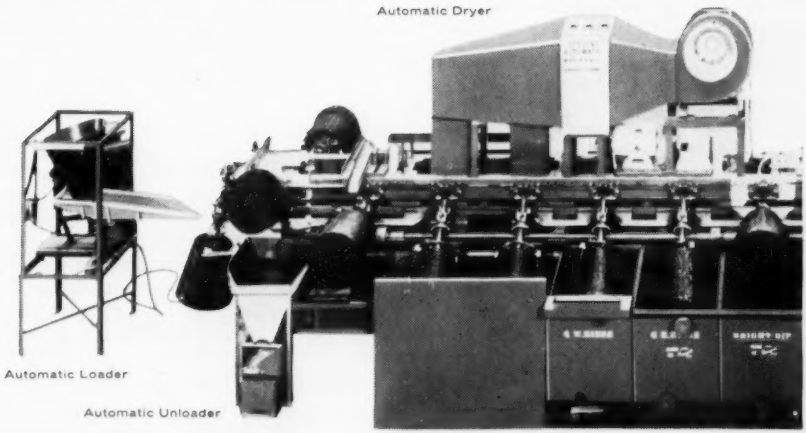
every 16 hours 2 million pounds of small parts are being plated or processed* in **STEVENS AUTOMATIC BARREL MACHINES**



*WASHING, BURNISHING, PHOSPHATING, BRIGHT DIPPING

It's a fact! Every working day a tremendous tonnage of small parts is being plated or processed in Stevens Automatic Barrel Machines. Why? Because Stevens builds the only barrel machine on the market today that provides complete automation.

AUTOMATIC LOADING...AUTOMATIC UNLOADING ...AND AUTOMATIC DRYING... are all within the machine. No extra equipment or floor space is required! When you think of truly automatic plating or processing, think of Stevens. Only Stevens can give you—

COMPLETE AUTOMATION • LOWEST COST PER PIECE
EXTRA SIMPLICITY OF OPERATION AND MAINTENANCE
EXTREME MECHANICAL FLEXIBILITY

Write today for complete information on this processing profit-builder.

frederic b. **STEVENS,** inc.

DETROIT 16, MICH.

BUFFALO CHICAGO DETROIT CLEVELAND
DAYTON NEW HAVEN INDIANAPOLIS SPRINGFIELD (OHIO)

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taminants are being pushed out.

Excess impregnant on the surface can be "spun off," drained out and saved.

Manufacturer: The Leon J. Barrett Company, P. O. Box 378, Worcester 1, Massachusetts.

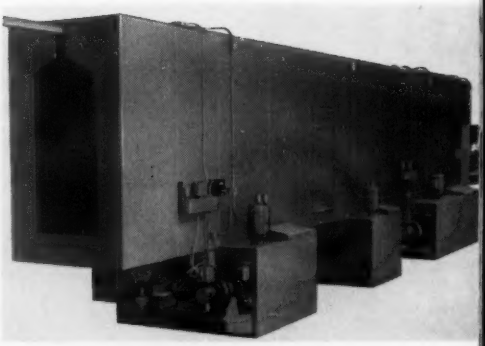
For more data circle **27** on Reader Service Card

★ ★ ★

Modular Washing Machine Units

Modular washing machine units introduced by Ramco Equipment Corporation provide the flexibility needed to meet present and long-range requirements for cleaning metal products prior to painting.

The modular units for power spray washing and phosphatizing are engineered so that additional stages can be added economically as process requirements change. Based on the size of the work to be processed, number of finishing stages required and hourly production needs, the proper modules can be put together by using a formula Ramco has worked out to aid engineers in selecting the units needed.



Ramco Modular Spray Washing Units

All the units have vertical, packless pumps, internal-plumbing headers, enlarged spray manifolds and mini-

(continued)

The Vibraslide Finisher's new Vibrating-Rotating action is bringing the best results yet achieved in barrel finishing . . . . faster, and at a fraction of previous costs.

newest method in barrel finishing!

ELLIOTT VIBRASLIDE BARREL FINISH EQUIPMENT

. . saves time, cuts cost, better results

Vibraslide finishes forgings, castings, machined parts and stampings up to four to eight times faster than other tumbling methods . . . . recessed areas and internal surfaces are smoother, more lustrous . . . . distortion, impingement damage, nicking and scratching are reduced to the minimum.

In two short years, Vibraslide machines have replaced or augmented barrel finishing equipment in some 80 leading industries.

distributed by
metal finish, inc. 410 Frelinghuysen Ave.
Call or Write for Demonstration Bigelow 2-6211 Newark, N. J.

For more data circle 381 on Postpaid Card

One of 3 Sel-Rex Platers in which Glass-Tite "barrel-plates" over 1-million components a week with Autronex Acid Gold.

Glass-Tite Industries Improves Transistor-Headers' Reliability with Autronex* Acid Gold Electroplate

In business only 3 years, Glass-Tite is already one of the three top producers of glass-to-metal, hermetically-sealed transistor products in the country. Their products meet or surpass, all applicable military finishing specifications.

Various Connectors

Diode Bases

Transistor Bases

These quality Autronex Gold Plated transistor products will be on display at the IRE Show, Mar. 21-24, N. Y. Coliseum, Glass-Tite Industries booth #1109.

Wrap transistor-header lead wires around a 40-thousandth mandrel—subject the headers to a scorching 400°C—dip them in a highly concentrated solution of hydrofluoric, nitric and acetic acids (CP-4) and you have some idea of what Autronex Acid Gold Electroplate withstands at Glass-Tite Industries, Inc. Providence, Rhode Island. Actually, all these "tests" are functional. The transistor headers will be subjected to similar conditions by military and industrial end-users while becoming critical components in complex electronic equipment.

According to Mr. John Newman, Chief Chemical Engineer at Glass-Tite, the Autronex Acid Gold Electroplating Process was installed because it demonstrated dramatic superiority over other materials. On one occasion, Mr. Newman relates, Autronex Gold Plated Transistor-Headers were left in the CP-4 etch solution *overnight*—"... just to see what would happen." By morning, the glass seals had dissolved, the Autronex Gold Electroplate had not been affected.

The famous glass-to-metal, hermetically sealed transistor bases produced by Glass-Tite Industries, end up in multi-million dollar, missiles, rockets, and computers. In applications like these, only the best is good enough. That's why Glass-Tite and leading electronic component manufacturers the world-over specify Autronex Gold Electroplate.

Sel-Rex are the largest selling Precious Metal Electroplating Processes in the world. Free technical literature on request—specify application.

*Trade mark for Sel-Rex patented Acid Gold Plating Process

Sel-Rex®

Exclusive Precious Metal Electroplating Processes

SEL-REX CORPORATION

NUTLEY 10, NEW JERSEY

For more data circle 382 on Postpaid Card

mum piping. Seal-tight covers keep vapors from escaping, are easily removed for cleaning out sludge.

Manufacturer: Ramco Equipment Corporation, a division of Randall Manufacturing Company, Inc., 811 Edgewater Rd., New York 59, N. Y.

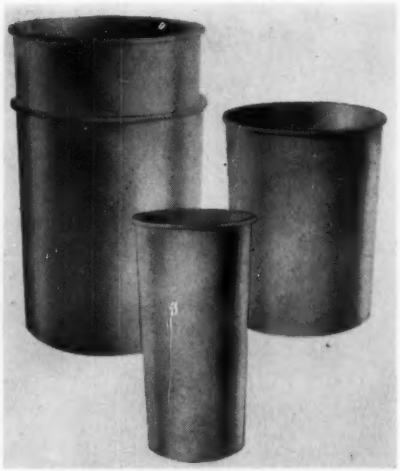
For more data circle **28** on Reader Service Card

★ ★ ★

Plastic Drums for Acid Storage

A large, molded polyethylene drum developed by Redmanson Corporation is resistant to corrosion which usually takes place in containers used to handle and store acids. The walls are uniform in thickness; there are no weak spots, no pinholes, the manufacturer reports.

Besides its ability to hold acids, these drums can be used as dipping tanks in semi-automatic electroplating lines. Various sizes, up to 55-gallon capacity.



Redmanson Polyethylene Drums: for acids

Manufacturer: Redmanson Corp., York, Pa.

For more data circle **29** on Reader Service Card

PAINT STRIPPER

THE NEW MIRACLE

STRIPEX #153

NO HEAT NECESSARY!

A mild steel tank is all that is required. Strips All Types of Baked Enamels. Some Baked Coatings are Stripped Clean in a matter of Seconds. Excellent for stripping vacuum metallizing racks.

DYTEX CHEMICAL COMPANY

DYTEX

Chemical Specialties

PROVIDENCE 3, Rhode Island

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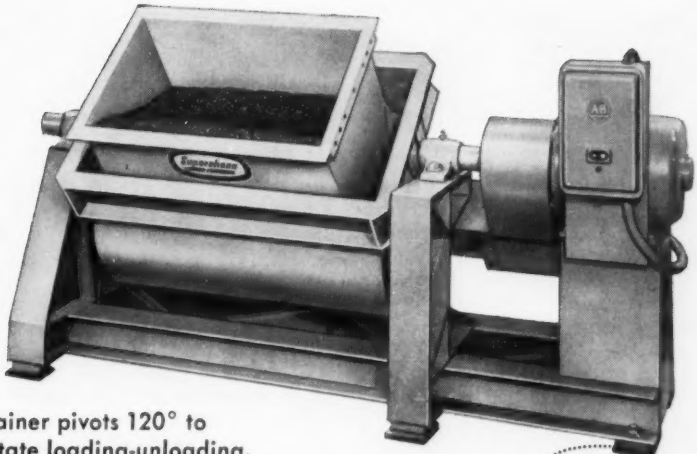

Container pivots 120° to facilitate loading-unloading.

ANOTHER REPORT FROM THE ALMCO ALBUM OF NEW PRODUCTS

ALMCO *Vibrasheen* FINISHES FASTER!

Constant vibratory motion . . . that's the secret of faster deburring and finishing you now get by using the new ALMCO *Vibrasheen* Method!

This amazing metal finishing machine vibrates a full 5 cu. ft. load* of parts and media . . . uses scrubbing action to remove burrs and finish parts in a fraction of the time required in ordinary barrel finishing operations.

The new *Vibrasheen* Method is particularly suited for faster burr removal from parts, and finishing hard-to-reach internal crevices. Can be used for deburring, descaling, cleaning, burnishing and surface refinement.

For full story on *Vibrasheen* Method and on processing sample parts, write for the new ALMCO Album of New Products!

* *Smaller and larger models also available.*

FREE!
NEW PRODUCT ALBUM
Gives full information on new Almco Supersheen Systems. Describes new and better machines, methods and media. Write today!

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QUEEN PRODUCTS DIVISION
King-Seeley Corporation
83 E. Main Street
Albert Lea, Minnesota

For more data circle 384 on Postpaid Card

Ultrasonic Cleaners

Clarkson Laboratories, Inc., has introduced a series of six cleaners for use in ultrasonic equipment. Each of the cleaners is designed for a specific cleaning job.

The series includes:

Sonic Duo Solve — a two-phase cleaner used cold to remove carbon, paint and other contaminants.

Sonic Solv—a blend of solvents and detergents for removing light soils from all metals. Used cold or to 160 deg. F.

Sonic Copper Brightener—for cleaning and brightening copper printed circuits and copper parts. Used cold or to 120 deg. F.

Sonic Acid Strip — for removing scale, rust and heavy soil where acid cleaning of metal is required. Can be heated to limit of ultrasonic unit.

Sonic Alka Strip—an alkaline cleaner for heavy-duty cleaning of steel parts and magnesium alloys. Can be heated to the limit of the ultrasonic unit.

Sonic Aluminum Brightener—cleans, brightens and deoxidizes aluminum and aluminum alloys. Used cold.

Manufacturer: Clarkson Laboratories, Inc., 930 N. Darien St., Philadelphia 23, Pa.

For more data circle **30** on Reader Service Card

★ ★ ★

Buffing-Test Machine

A machine that permits makers and users of buffs and compounds to evaluate finishing-process variables accurately has been introduced by Acme Manufacturing Company.

The testing machine consists of a standard Acme G-1 adjustable lathe and a mechanism for moving sample materials past the buffing wheel, plus

IMMEDIATE SERVICE and DELIVERY in U.S. and CANADA

America's Foremost Chemical Polishing Concentrate. Alchemize levels surfaces, producing any finish from satin to mirror-bright on otherwise impossible shapes and sizes. Want proof? We'll process **your** samples and make recommendations without charge.

Available in carboys, drums and tank trucks.

ALCHEMIZE CORPORATION • Congress Expressway and South Kolmar • Chicago 24, Ill.

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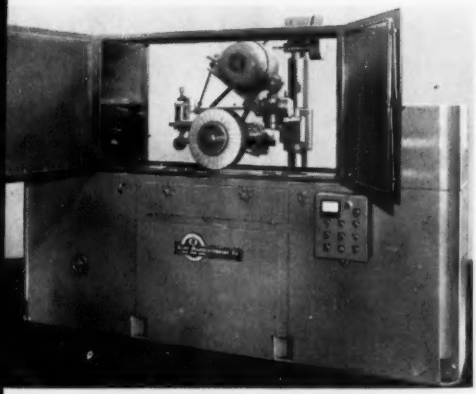

Acme Testing Machine: evaluates buffs and compounds, determines which processing conditions are best for a given job

a mechanism for adjusting wheel pressure; a beam scale for measuring wheel pressure accurately; a variable-speed drive that makes it possible to vary feed rates from 10 to 30 f.p.m.; a mechanism for adjusting wheel speeds from 700 to 2,100 r.p.m.; a mechanism for adjusting wheel pressures up to 50 pounds; and an instrument for measuring the amount of horsepower drawn by the motor driving the buffing wheel.

Thus it is possible to vary pressure, wheel speed and rate of sample feed.

By examining the finish produced in using a given type of buff, compound and basis metal and recording the amount of horsepower required under various sets of process conditions, it is possible to evaluate the materials being used and select the proper wheel speeds, pressures and feed rates.

The Acme machine is a production model of a prototype delivered to the American Electroplaters' Society in 1957 for use in finishing research programs.

Manufacturer: Acme Manufacturing Co., 1400 E. Nine Mile Rd., Detroit, Mich.

For more data circle **31** on Reader Service Card

SPRA-CON

COMPLETE FINISHING SYSTEMS

POWER SPRAY WASHERS

DRYING OVENS

PAINT BAKING OVENS

FLOW COAT MACHINES

AIR REPLACEMENT SYSTEMS

CONVEYORS

SEND FOR FREE CATALOG

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SPRA-CON COMPANY

3600 ELSTON AVE. • CHICAGO 18, ILLINOIS

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. . . BAIRD

And there's a lot to look at! Who else but Baird can supply almost every conceivable barrel finishing equipment need?

COMPLETE BARREL FINISHING UNITS

The famous Poliaction series, Hydratilt and Electratilt . . . ball burnishers . . . obliques . . . Multipacts for super high production output . . . steam and electrically heated machines . . . and more!

REPLACEMENT BARRELS

Polygonals in wood . . . cast barrels of iron, brass, monel or Everdur . . . sheet metal barrels, all-round or polygonals with angle or round-corner bottoms . . . bottle shapes.

PROBLEM-SOLVING TEST SERVICE

Send samples of your parts along with specifications and a small quantity of finished, acceptable parts. We will give you data on recommended barrels, media, speeds, etc. No charge, of course.

Write today for Catalog No. 50 . . . 20 fully illustrated pages in color on Baird Barrel Finishing and Tumbling equipment.

BAIRD

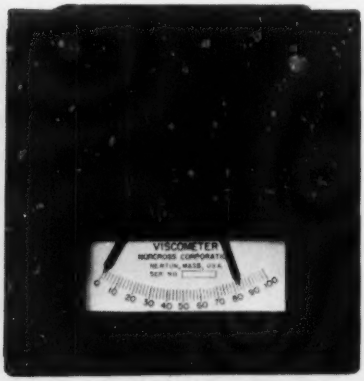
THE BAIRD MACHINE CO.
Barrel Finishing Equipment Div.
600 Stratford Ave., Stratford, Conn.

For more data circle 387 on Postpaid Card

Viscosity-Indicating Controller

The Norcross Corporation has introduced an indicator and indicating controller to provide viscosity control at a lower cost for applications where a permanent record is not required.

These models are for use with Norcross' basic measuring elements, which operate on the principle of measuring



Instrument Measures and Controls Viscosity

the time required for a piston to fall a given distance through the solution to be measured. The Indicator and Indicating Controller can be placed at any reasonable distance from the Measuring Element and can be furnished with high and low viscosity alarms.

Manufacturer: Norcross Corporation, Dept. No. N68, Newton 58, Mass.
For more data circle **32** on Reader Service Card

★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★

Correction

In the article *Coolers and Heaters for Anodizing* published in the December, 1959, issue of PRODUCTS FINISHING, it was erroneously reported that Tranter Manufacturing, inc., is in Niles, Mich. The correct address is Lansing, Mich.—Ed.

Once you use it you'll Order... Again... and Again... and Again!

Every can filled with a full weight of extra high quality 99.75+% Chromic Acid. Prompt delivery made from ample factory and nearby distributor stocks.

PAINTS · PLASTICS · CHEMICALS · BFC

BETTER FINISHES & COATINGS, INC.

268 Doremus Avenue, Newark 5, N. J. · 2014 East 15th St., Los Angeles 21, Calif.

For more data circle 388 on Postpaid Card

Free Literature

(Circle numbers on postpaid card opposite page 128 to obtain free literature)

Polishing, Buffing, Degreasing, Cleaning, Barrel Finishing, Plating, Anodizing, Phosphatizing, Baking, Vacuum Metallizing, Chromate Coating, Paint Finishing, Waste Treatment.

40. Barrel Finishing Materials, Methods
Bulletin 3e/A1 describes Almco barrel finishing machines and methods. Includes data on company's advanced-design series; Model DBO-1A, a twin-barrel model for small shops; Model DBO-2A, a machine for processing small and medium lots of parts; various special machines; and a complete line of compounds and media. Almco, Queen Products Div., King-Seeley Corp., Albert Lea, Minn.

41. Paint Strippers
Information on Lea Synstrip, a fast-working, non-corroding liquid stripper. Will not attack aluminum, zinc or any other base metal or alloy. Does not dissolve the coating — breaks the bond. Strips tough finishes. Lea Manufacturing Co., 16 Cherry Ave., Waterbury 20, Conn.

42. Spray Equipment for Multiple-Component Materials
Bulletin A-54-5 on the Binks Turbulator gun and Formulator. This equipment is designed for mixing multiple-component organic coatings within the spray gun and then spraying them immediately. Such materials are used in spraying films of various plastics and foams which must be mixed with a catalyst and then sprayed immediately, before the chemical reaction causes hardening. Binks Manufacturing Company, 3118-40 Carroll Ave., Chicago 12, Ill.

43. Coated Abrasives Selector Chart
Form No. A-1507 is a hand chart that shows which type of belt, sheet, disc or roll to use for performing various types of operations (roughing, semi-finishing, snagging, etc.) on steel, stainless steel, zinc, aluminum, brass and bronze. Carborundum Co., Niagara Falls, N. Y.

44. Power Supplies
Folder describes advantageous features of Clinton rectifiers and shunts. Includes information on company's exclusive "Dual-O-Matic" transformer circuit. Clinton Supply Co., Rectifier Manufacturing Div., 110-112 S. Clinton St., Chicago 6, Ill.

45. Filters, Filter Media
An eight-page catalog (GEO-506A) entitled "Complete Filtration for Liquids and Gases" gives a brief description of each of the products in the CFC line of filtration equipment. The line includes Fulflo, Delpark, Honan-Crane and Michiana Filters for continuous clarification of all types of industrial fluids—chemicals, gases, oils, and water. Information is classified according to applications, operating pressures, and sizes. In addition to the filters, various types of filter media are described and illustrated. Commercial Filters Corporation, 2 Main St., Melrose, Mass.

Cut Your Degreasing Costs 50%

NEW Roll Type Cover Fits All Vapor Degreasers
BARON ECON-O-LID
- Easy to roll open or shut.
- Gives full access to work area.
- Easy to install.

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BARON INDUSTRIES
241 W. Avenue 26, Los Angeles 31, Calif.

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46. Metal Salts
Information on a line of inorganic salts —cobalt, nickel, copper, zirconium, rare earths, thorium products, other salts. Vitro Chemical Co., a Subsidiary of Vitro Corporation of America, 261 Madison Ave., New York 16, N. Y.

47. Ultrasonic Cleaning System
Data sheet on new Detrex ultrasonic cleaning system. Detrex Chemical Industries, Inc., Box 501, Detroit 32, Mich.

48. Wet-Film Thickness Gage
Detailed description of Interchemical Wet-Film Thickness Gage, an instrument that shows thickness of film by rolling the gage over the wet film. Gardner Laboratory, Inc., Bethesda 14, Maryland.

49. Electroplating Equipment
An eight-page bulletin describes Frederick Gumm Chemical Company's line of plating equipment and supplies. Equipment includes immersion heaters, steam generators, vapor degreasers, spray washing machines, temperature controllers, rectifiers, filters, tanks, racks, baskets and plating barrels. Also includes information on several instruments useful in finishing. Frederick Gumm Chemical Co., Inc., 538 Forest St., Kearny, N. J.

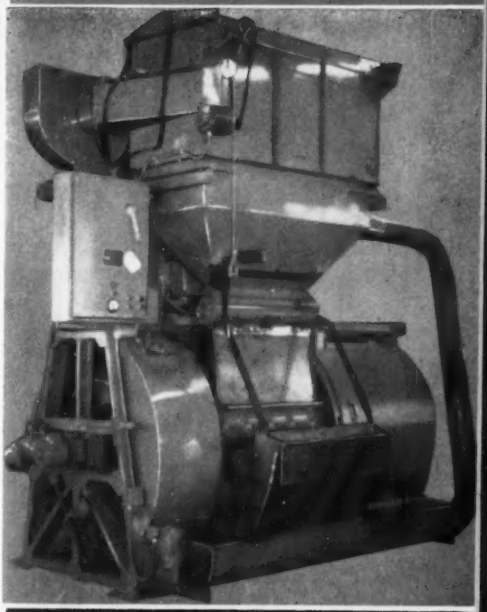
50. Chemical Products
Bulletin 100-C contains brief descriptions, physical data, uses and shipping information with respect to the many chemicals listed. Hooker Chemical Corporation, Niagara Falls, N. Y.

51. Automatic Polishing Equipment
Information on automatic polishing and buffing machines. Harper Buffing Machine Co., East Hampton, Conn.

52. Wetting Agent
Technical Data Sheet No. 94 describes a liquid wetting agent particularly intended for use in strong oxidizing solutions, such as chromic and nitric acids. Called Macro Wet 1, this material is effective in all chromate processes for zinc, cadmium, silver and aluminum. Reduces dragout. MacDermid, Inc., Waterbury 20, Conn.

53. Application Data on Metal-Treatment Chemicals
Extracts Book No. 3 contains data taken from salesmen's reports on the company's products for metal cleaning and treatment. These reports tell how the various products have solved problems and improved efficiency. Harry Miller Corp., 4th and Bristol Sts., Philadelphia 40, Pennsylvania..

. . . the HARPERIZER



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NO BUFFS — NO FIXTURES

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- HI—G—*Free Grain* — ACTION can produce similar savings on over half the jobs now buffed.
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Finest automatic machines using wheels and fixtures to buff, deburr and polish

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We want it to dry ☐ Fast ☐ Medium ☐ Slow
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City_____ Zone___ State_____

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Cambridge City 2, Indiana
Write to your nearest location

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54. Paint Bonding
A complete line of cold and hot paint strippers is described in Emulsoprep and Strip-Prep bulletins. Neilson Chemical Co., 2302 Gainsboro, Detroit 20, Michigan.

55. Centrifugal Dryer
Form No. 4083-KD-459-S gives complete information on the Model 20 New Holland Kreider Centrifugal Dryer, which spin dries a basket of small parts in just 15 seconds. New Holland Machine Co., New Holland, Pa.

56. Airless Spray Equipment
An eight-page booklet gives complete details on Nordson airless spray equipment. This system makes use of both heat and hydraulic pressure in atomizing the paint. System and its components are described and illustrated in detail, common questions are answered. Nordson Corporation, Amherst, Ohio.

57. Barrel Finishing Compound
Oakite Service Report B-6644 describes Oakite FM 103, a material formulated to increase brightness of work coming out of all burnishing and tumbling operations. Oakite Products, Inc., 20 Rector St., New York 6, N. Y.

58. Vapor Degreasers
Folder shows company's line of vapor degreasers: batch type, combination, "Rotomatic," conveyor-type, "Torrent" washers. Phillips Manufacturing Co., 3457 W. Touhy Ave., Chicago 45, Ill.

59. Enamel Reducer
Literature describing how Hi-Sol enamel reducer cuts costs in ready-to-spray paints. Information on elimination of sagging and methods of producing a smoother, better-looking finish. Potter Paint Co., Inc., 22 Crawford St., Cortland, N. Y.

60. Rectifiers
Brochure covers a line of regulated d.c. power supplies. Shows models available, describes features and applications. Rapid Electric Co., 2881 Middletown Rd., New York 61, N. Y.

61. Furnaces and Ovens for Aluminum
Bulletin No. 128 describes Rockwell furnaces and ovens for aluminum. W. S. Rockwell Co., 2900 Eliot St., Fairfield, Conn.

62. Acid Gold Plating Process
Six-page paper (Booklet AG-2) describes metallurgical properties, operational features and uses of Autronex gold electroplating formulation. This technical report covers in detail composition, deposit characteristics, corrosion resistance, equipment requirements, solution makeup and maintenance. Sel-Rex Corporation, Nutley, N. J.

THE NEW
BRIGHT NICKEL PROCESS

LEVELMAX

for excellent brightness, levelling, and ductility at low cost

Now—for the widening use of nickel plating and the new plating problems brought about by the wider variety of shapes and base metals—ASARCO has developed a new process, simple to control and maintain. LEVELMAX will tolerate considerable organic and metallic contamination even with infrequent purification or treatment. Buffing and finishing of the base metal can often be completely eliminated. Hard-to-buff areas can be plated bright. The bright-nickel surface readily accepts chrome. Corrosion resistance is excellent. Maximum productivity is assured by high current densities which are successfully used with the LEVELMAX process. Conventional or air agitation can be used. Analytical procedures are provided for the determination of all constituents. Write for complete working details about the new LEVELMAX BRIGHT NICKEL PROCESS to Federated Metals Division of American Smelting and Refining Company, Electrochemicals Dept., 120 Broadway, New York 5, N. Y. In Canada, Federated Metals Canada, Ltd., Toronto and Montreal.

ASARCO

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STAMPINGS VACUUM METALLIZED

BRIGHT FINISH . . . LOW COST . . . HIGH QUALITY

Now you can eliminate your high polishing and plating costs and obtain the same results by hi-vacuum.

METAPLAST has the "know-how" and specially built equipment to handle large production runs at low prices. Finishes have been successfully applied in the lamp, cosmetic and houseware industries.

Write for further details.

Pioneers in Vacuum Metallizing since 1947

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Woodside, L. I., New York

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63. Selenium Rectifiers
A four-page folder gives specifications for complete line of vacuum-process selenium rectifiers. Syntron Co., Homer City, Pa.

64. Heat-Resistant Acid Bright Gold
Booklet gives complete technical information on Orotherm HT, a heat-resistant 24K acid bright gold plate. This solution produces a gold plate that will resist temperatures of 400 deg. C. for at least five hours; hardness of 150-plus Knoop; mirror brightness; one-addition-agent control; and flexibility. Technic, Inc., P. O. Box 965, Providence, R. I.

65. Easily Repaired Plating Cylinders
Folder on the new Udylok-Tempron barrel plating cylinder. This cylinder has interlocking construction which makes it possible to repair and replace panels quickly in the shop. Udylite Corporation, Detroit 11, Mich.

66. Bright Copper
Data sheet describes Cynorex high-speed copper cyanide plating process and Cuprex acid copper plating process, tells about advantages of each. Harshaw Chemical Co., 1945 E. 97th St., Cleveland 6, Ohio.

67. Barrel Finishing Booklet
Booklet describes barrel finishing equipment, materials, how to use them. Abbott Ball Co., 17 Railroad Ave., Hartford 10, Conn.

68. Immersion Gold Plating Solution
Information on Atomex immersion gold plating solution, which will deposit a thin coating of gold on many parts by simple immersion. Engelhard Industries, Inc., Chemical Div., 113 Astor St., Newark 5, N. J.

69. Wood Tanks
Information on wood tanks for pickling and plating. Kalamazoo Tank & Silo Co., 1571 Harrison St., Kalamazoo, Mich.

70. Automatic Polishing-Buffing Machine
Folder describes and illustrates Murray-Way Junior Automatic Polishing and Buffing Machines. Includes list of advantages, description of features, specifications. Murray-Way Corporation, P. O. Box 180, Birmingham, Mich.

71. Spin Finish
Information on the Spin Finish method of deburring and finishing fixtured parts in a loose abrasive media. Grav-I-Flo Corporation, Dept. PF, 400 Norwood Ave., Sturgis, Mich.

72. Gloves
Information on Sureseal gloves, made especially for use in handling acids and caustics. The Surety Rubber Co., Carrollton, Ohio.

For more data on advertisement on opposite page, circle 394 on Postpaid Card →

MARCH, 1960

1	17	33	49	65	81	97	113	129	145	301-2nd Cov.	330	346	362	378	394	410	426	442
2	18	34	50	66	82	98	114	130	146	302-3rd Cov.	331	347	363	379	395	411	427	443
3	19	35	51	67	83	99	115	131	147	303-4th Cov.	332	348	364	380	396	412	428	444
4	20	36	52	68	84	100	116	132	148	304	317	333	349	365	381	397	413	429	445
5	21	37	53	69	85	101	117	133	149	305	318	334	350	366	382	398	414	430	446
6	22	38	54	70	86	102	118	134	150	306	319	335	351	367	383	399	415	431	447
7	23	39	55	71	87	103	119	135	151	307	320	336	352	368	384	400	416	432	448
8	24	40	56	72	88	104	120	136	152	308	321	337	353	369	385	401	417	433	449
9	25	41	57	73	89	105	121	137	153	309	322	338	354	370	386	402	418	434	450
10	26	42	58	74	90	106	122	138	154	310	323	339	355	371	387	403	419	435	451
11	27	43	59	75	91	107	123	139	155	311	324	340	356	372	388	404	420	436	452
12	28	44	60	76	92	108	124	140	156	312	325	341	357	373	389	405	421	437	453
13	29	45	61	77	93	109	125	141	157	313	326	342	358	374	390	406	422	438	454
14	30	46	62	78	94	110	126	142	158	314	327	343	359	375	391	407	423	439	455
15	31	47	63	79	95	111	127	143	159	315	328	344	360	376	392	408	424	440	456
16	32	48	64	80	96	112	128	144	160	316	329	345	361	377	393	409	425	441	457

NAME _____ POSITION _____

COMPANY _____

STREET _____

CITY _____ ZONE _____ STATE _____

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1	17	33	49	65	81	97	113	129	145	301-2nd Cov.	330	346	362	378	394	410	426	442
2	18	34	50	66	82	98	114	130	146	302-3rd Cov.	331	347	363	379	395	411	427	443
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4	20	36	52	68	84	100	116	132	148	304	317	333	349	365	381	397	413	429	445
5	21	37	53	69	85	101	117	133	149	305	318	334	350	366	382	398	414	430	446
6	22	38	54	70	86	102	118	134	150	306	319	335	351	367	383	399	415	431	447
7	23	39	55	71	87	103	119	135	151	307	320	336	352	368	384	400	416	432	448
8	24	40	56	72	88	104	120	136	152	308	321	337	353	369	385	401	417	433	449
9	25	41	57	73	89	105	121	137	153	309	322	338	354	370	386	402	418	434	450
10	26	42	58	74	90	106	122	138	154	310	323	339	355	371	387	403	419	435	451
11	27	43	59	75	91	107	123	139	155	311	324	340	356	372	388	404	420	436	452
12	28	44	60	76	92	108	124	140	156	312	325	341	357	373	389	405	421	437	453
13	29	45	61	77	93	109	125	141	157	313	326	342	358	374	390	406	422	438	454
14	30	46	62	78	94	110	126	142	158	314	327	343	359	375	391	407	423	439	455
15	31	47	63	79	95	111	127	143	159	315	328	344	360	376	392	408	424	440	456
16	32	48	64	80	96	112	128	144	160	316	329	345	361	377	393	409	425	441	457

NAME _____ POSITION _____

COMPANY _____

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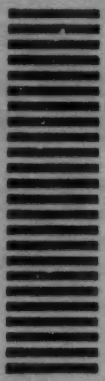

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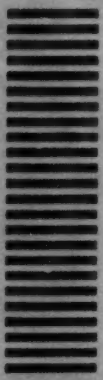
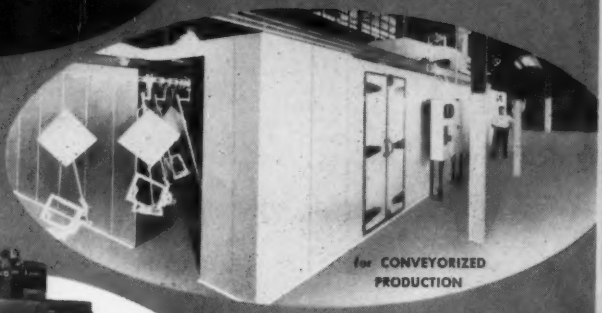


KIRK AND BLUM
INDUSTRIAL OVENS



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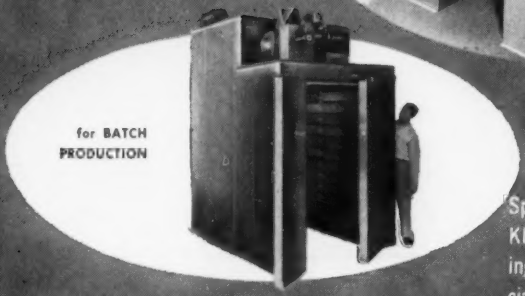

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Specially designed to solve your problem . . . KIRK & BLUM Ovens meet all needs for drying, baking, dehydrating or other more specialized requirements.

Often Kirk & Blum Ovens up to freight car size are shipped completely assembled, tested and ready to operate. Then, they can be connected and in use in a few hours, saving time and expense. Illustrated are typical installations which show the wide range of KIRK & BLUM experience over more than 47 years.

If you have an oven application, discuss it with a KIRK & BLUM Engineer. There's no obligation. Write for free literature.

THE KIRK & BLUM MFG. CO.,
3116 Forrer St., Cincinnati 9, Ohio

KIRK AND BLUM
INDUSTRIAL OVENS

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73. Guide to Aluminum Processing Chemicals
Six sections: aluminum and its alloys; cleaning operations for aluminum; etching aluminum; stripping anodic coatings; stripping paint from aluminum; cleaning aluminum before anodizing. Magnuson Products Corporation, 50 Court St., Brooklyn 1, N. Y.

74. Clear Semi-Gloss Lacquer
Information on Agateen No. 2B semi-gloss lacquer. Agate Lacquer Mfg. Co., Inc., 11-13 43rd Rd., L. I. City, N. Y.

75. Chemical Polish for Aluminum
Information on Alchemize Chemical Polishing Concentrates. Alchemize Corp., 621 S. Kolmar Ave., Chicago 24, Ill.

76. Plating Brighteners
Data file on the company's line of "chemically different" plating brighteners. Allied Research Products, Inc., 4004-06 E. Monument, Baltimore 5, Md.

77. Anodizing Racks
Information on titanium strip, bars, rods, wire, fasteners, sheets, expanded metal—components to make your own racks. American Titanium Corp., 3129 E. Larned St., Detroit 7, Mich.

78. Conveyor Chain
Bulletin illustrates and describes Alvey-Ferguson engineered Conveyor Chain, contains dimensional prints of various sizes of special chain, includes installation photographs showing its use as slat conveyors, pusher-bar boosters and as side chains for open types of belting in metal cleaning and processing machines. The Alvey-Ferguson Co., 666 Disney St., Cincinnati 9, Ohio.

79. Electrocleaner
Information on Apex "Electro 100" cleaning compound, a general-purpose low-current-density electrolytic cleaner. Apex Alkali Products Co., Main & Rector Sts., Philadelphia 27, Pa.

80. Air-Wash Systems
Bulletin No. 256 describes acid-proof air washers for removing fumes and corrosive gases from exhaust air. Tells how these units work, lists materials of construction and accessories that are available. Automotive Rubber Co., Inc., 12553 Beech Rd., Detroit 39, Mich.

81. Horizontal Tumbler
Data sheet describes features of the new Baird Finishmaster, a horizontal barrel finishing machine. The Baird Machine Co., Stratford, Conn.

M E P A

MASTERS' ELECTRO-PLATING ASSN., INC.

requests the pleasure of your presence

at its

Forty-Second Annual Banquet

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Saturday, May 14th, 1960

The Plaza — Grand Ballroom — New York City

Twenty-Five Dollars Per Person

Tickets are available from the Association Office, 59 East 4th Street, New York 3, New York

Reception and Cocktails 6:30 p.m.

Dress Optional

A WAY TO DEGREASE MORE PARTS PER DOLLAR OF CLEANING COST

What makes the big difference in vapor-degreasing cost?

It's not what you pay for solvent. It's how long your solvent keeps working between degreaser cleanouts.

WHAT'S PSP? It means "permanent staying power." It's what you get with Nialk TRICHLOR. The stabilizer in this solvent doesn't wear out. You don't need to add fresh stabilizer when you degrease with Nialk TRICHLOR. You don't have to check the pH. The stabilizer stays with the solvent and keeps on protecting it. In the bath. In the vapor. Even after repeated distillation.

WHY IS PSP IMPORTANT? Users report substantial savings with this better, more stable trichlorethylene. Degreasers run without shutdown for weeks—even months longer between cleanouts, in many cases. Rejects are down sharply. Less solvent is needed, because less goes down the drain in unnecessary cleanouts.

To start saving in your plant—soon—see your Nialk TRICHLOR distributor. He can show you why your best buy is the solvent that doesn't wear out prematurely. Call him today.

NEW 36-PAGE BULLETIN explains fully how you get more and better vapor degreasing for the money with Nialk TRICHLOR. Shows basic types of vapor degreasers. Discusses cycles, operating procedures, stabilizers, causes of solvent contamination, solvent recovery, trouble shooting. Ask your distributor for a copy or write us.

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HOOKER CHEMICALS PLASTICS

Sales Offices: Buffalo Chicago Detroit Los Angeles New York Niagara Falls Philadelphia Tacoma Worcester, Mass.
In Canada: Hooker Chemicals Limited, North Vancouver, B. C.

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82. Felt Polishing Products
A 12-page booklet describes felt wheels, tells about typical applications; has table to aid in selection of felt wheels; table of specifications; directions for setting up and caring for felt wheels; maintenance "do's" and "don'ts"; other useful data. Bacon Felt Co., 447 W. Water St., Taunton, Massachusetts.

83. Metal-Treatment Materials
New folder describes company's line of black oxide finishes, chromate coatings, cleaners, oils and strippers. Heatbath Corp., Springfield 1, Mass.

84. Titanium Racks for Anodizing
Illustrated brochure on the company's line of all-titanium anodizing racks. LeVita Industries, Inc., 3125 E. Larned St., Detroit 7, Mich.

85. Electrocleaners
Information on Magnus electrocleaning products. Magnus Chemical Co., Inc., 208 South Ave., Garwood, N. J.

86. Degreasers
Catalog describes laboratory, two-dip, three-dip, vapor-spray, barrel-type automatic, and semi-automatic degreasers. Mechanical Process Co., Inc., 392 Valley St., South Orange, N. J.

87. Abrasive Belt Polishing Machines
Information on Hill Acme abrasive belt polishing machines for polishing flat surfaces of ferrous and non-ferrous metals. The Hill Acme Co., 1209 W. 65th St., Cleveland 2, Ohio.

88. Rinse Aid
Information on Rins-Aid, an additive for rinse water. It prevents staining and tarnishing and hastens drying. R. O. Hull & Co., Inc., 1304 Parsons Ct., Rocky River 16, Ohio.

89. Ovens for Industry
"Ovens for Industry" catalog describes and illustrates many different types and sizes of industrial ovens. Kirk & Blum Mfg. Co., 3116 Forrer St., Cincinnati 9, Ohio.

90. Tumbling Machines
Literature describes and illustrates various tumbling machines. H. W. Kramer Co., 120-30 Jamaica Ave., Richmond Hill 18, New York.

91. Plating Course
Information on a correspondence course in electroplating. Joseph B. Kushner Electroplating School, P. O. Box 2066, Station "D," Evansville 14P, Indiana.

Clinton

NEW AND REBUILT
PLATER'S EQUIPMENT

Complete warehouse stock of PLATING AND POLISHING EQUIPMENT AND SUPPLIES available for immediate delivery.

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RECTIFIERS

We buy, sell, liquidate and auction complete metal finishing plants.

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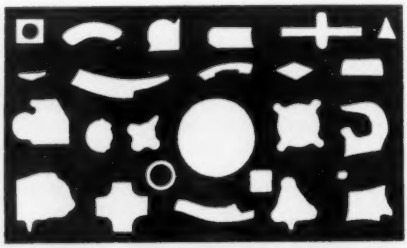

Pre-Cut Masks Speed Finishing

Eliminates hand cutting! Brady self-sticking pre-cut Masks are die-cut to close tolerances — go on fast and accurately — protect from finishing to inspection. Hundreds of shapes and sizes in stock for immediate delivery. Distributors in over 300 principal cities.

NARROW-SLIT MASKING TAPES — For fine line masking. Precision slit to .005" tolerances. Widths from 1/64" to 1/4" — 30 yard rolls.

Write for free samples and bulletin No. 160. 40A

W. H. Brady Co.
746 W. Glendale Ave., Milwaukee 9, Wis.

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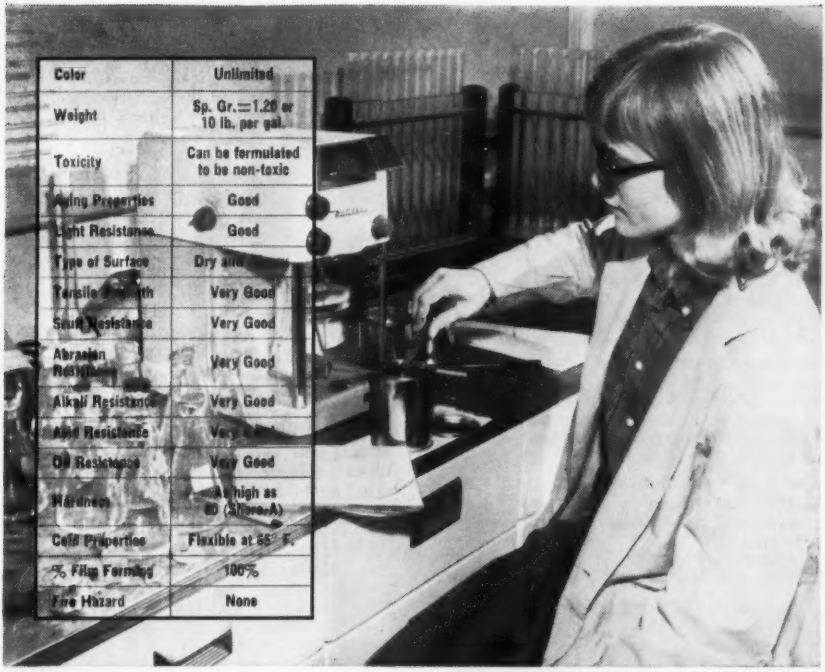

Whether you coat steel, wire or cloth, you'll want to investigate the special qualities—and costs—of

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92. Drum-Handling Tools
Literature on a line of drum-handling tools and equipment: drum upenders, drum wrenches, carts and so on. Morse Mfg. Co., Inc., 762 W. Manlius St., E. Syracuse, N. Y.

93. Barrel Finishing Machined Parts
A report on methods of barrel finishing machined parts such as aircraft gears tells how barrel finishing improves surface finish and fatigue strength, removes burrs, forms uniform radii and reduces production costs. Norton Co., Worcester 6, Mass.

94. Nickel Plating Salts
Information on company's line of "Quality Certified" nickel plating salts. Nuodex Products Co., Elizabeth, N. J.

95. Black Oxide
Bulletin H-16 tells how to produce a rust-resistant black finish that is also an excellent base for topcoats of lacquer or enamel. Park Chemical Co., 8074 Military Ave., Detroit 4, Mich.

96. Cold Phosphatizing
Details on cleaners and phosphatizing products that will operate at temperatures 40 to 75 deg. F. cooler than conventional systems. Parker Rust Proof Co., 2172 E. Milwaukee Ave., Detroit 11, Mich.

For cleaning metal, wood and plastic surfaces before painting. Order today through your supplier.

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97. Strippable Vinyl Coatings
Four-page folder MP-314 describes strippable vinyl coatings for protecting surfaces during processing and in storage. Includes data on typical uses, application and removal. Pennsalt Chemicals Corporation, Three Penn Center, Philadelphia 2, Pennsylvania.

98. Glove-Selection Guide
Handy pocket folder offers a comprehensive guide to selecting the correct glove for a particular industrial application. Includes detailed chemical-performance ratings, outlining tests made with various reagents and solvents. Pioneer Rubber Co., Inc., 285 Tiffin Rd., Willard, Ohio.

99. Barrel Finishing Machines
New catalog illustrates and gives complete details on all Rampe's barrel finishing machines, including 30 X 32, Rampe's newest, heavy-duty machine. Rampe Mfg. Co., 14915 Woodworth Ave., Cleveland 10, Ohio.

100. Clear Lacquers
Data on clear lacquers especially formulated to be used in protecting highly polished metals and those that tarnish easily. Randolph Products Co., Carlstadt, New Jersey.

101. Electrostatic Spray Gun, Hand-Held
Twelve pages. "Spray Painting with the Electrostatic Hand Gun." Principles and uses of recently introduced hand-held electrostatic spray painting gun. Photos of production applications. Ransburg Electro-Coating Corp., P. O. Box 23122, Indianapolis 23, Indiana.

102. Finishing Systems
New 4-page catalog describes machinery and systems for metal surface processing (cleaning, washing, rinsing, drying, spraying, flow and dip coating). Includes information on drum-type machines, conveyor machines and systems, combination drum and conveyor machines, and complete automatic finishing systems. Ransohoff/Roto-Finish, Hamilton, Ohio.

103. Overspray Collector
A four-page folder gives general information on RP paint arrestors, dry filters that remove overspray paint from exhaust air. Includes installation instructions, performance data, construction details. Research Products Corporation, Dept. 38, Madison 10, Wisconsin.

104. Coatings for Steel
Information on the company's line of organic coatings for steel. These products are said to offer greater resistance to temperature, excellent color control, greater tensile strength. Reynolds Chemical Products Co., Whitmore Lake, Mich.

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IMMUCOTE 887

Reg. U.S. Pat. Off.

It Cleans and Phosphates in One Step . . . Before Painting

~~Alkali Cleaning, 10 minutes~~
~~Hot Water Rinse, 1 minute~~
~~Phosphate Dip, 5 minutes~~
~~Cold Water Rinse~~
~~Chromic Acid Bath~~

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1½ minutes

Cleaning and phosphating metals with IMMUCOTE 887 is far simpler than the old 5-step method, effects large savings in time, material and equipment, and insures a perfect paint job. In practice, steel parts, coated with the original rolling and rust-protective oil, are dipped in a solution of IMMUCOTE 887 diluted 1 to 30 with plain water, used at a temperature of 160°F. Only 1½ minutes are required to clean perfectly and give the proper phosphate coating. For additional rust-resistance, parts can be lowered into a 2nd bath containing IMMUNOL NF diluted 1 to 300 with plain water, used at 185°F. Drip drying is almost immediate with no wiping necessary and parts can be stock-piled as long as ten days. Paint adhesion is excellent and superior finish and salt spray resistance are obtained. This treatment can also be used for parts to be drawn or formed.

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ONE-STEP METHOD

Costs less—takes less time, chemicals and equipment • Simple, foolproof to use—no critical control of cycle involved • Solution lasts up to seven weeks • No toxic vapors or solvents • Better bonding, finish, and salt spray resistance **SUPERIOR TO ANY PHOSPHATING PROCESS INCLUDING THE VAPORIZED CHLORINATED SOLVENTS METHOD!**

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105. Sealer for Anodized Aluminum
Data sheet describes Sandofix ALU, a non-smutting sealer for anodized aluminum. Sandoz, Inc., 61 Van Dam St., New York 13, N. Y.

106. Adjustable-Joint Spray Nozzles
Reference data on adjustable joints for spray nozzle installations. Bulletin 97. Typical applications for these products: washing, coating, rinsing. Ball-and-socket design permits swivelling nozzle through 50-degree arc. Spraying Systems Co., 3229 Randolph St., Bellwood, Ill.

107. Automatic Plating Machines
An eight-page bulletin on Stevens automatic rack processing and plating machines for electroplating, anodizing, stripping, cleaning, phosphatizing and similar immersion processes. Frederic B. Stevens, Inc., 1800 18th St., Detroit 16, Michigan.

108. Filter Pump Units
Bulletin 103 contains complete data on Sethco filter pumps for removing solids from acid and alkaline solutions. Sethco Mfg. Co., 2292 Babylon Turnpike, Merrick, N. Y.

109. Washing Machine
Bulletin 107 describes the Vibra-Washer, an automatic parts washer and metal conditioning machine which employs a vibrating work carrier that automatically conveys parts through cleaning or conditioning baths. Simplicity Engineering Co., Durand 25, Mich.

110. Chromium Chemicals
Bulletin 52 contains technical information on chromic acid and other products. Solvay Process Div., Allied Chemical Corp., 61 Broadway, New York 6, N. Y.

111. Solvents
Information on acetates, alcohols, aliphatic hydrocarbons, alkanolamines, aromatic solvents, chlorinated hydrocarbons, glycols and polyglycols, glycol ether, other solvents. The Solvents and Chemicals Group, 2540 West Flournoy St., Chicago 12, Ill.

112. Finishing Systems
A 36-page book describes and illustrates complete finishing systems and components such as washers, dryers, bake ovens, flow coat systems, dip-painting systems, spray painting systems, others. Includes diagrams of several systems, comparison of operating costs for Spra-Con systems vs. other types. Also has a page of useful engineering formulas and constants. The Spra-Con Company, 3600 Elston Ave., Chicago 18, Ill.

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Write (Dep't. P) on your letterhead for catalog and price list.

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Engineered Atmospheres for Better Processing

6

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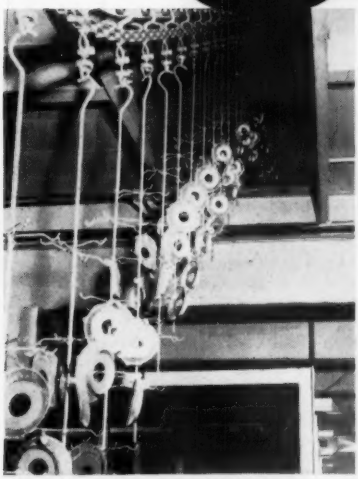
- Paint Application Methods
- More Efficient Heater and Fans
- Modern Dryers and Ovens
- Better Application of Air
- Revamp to Accommodate New Formulations

Broad Targets for Modernizing Your Paint Finishing Section



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113. Belt-Driven Barrel Plating Units
A four-page folder describes and illustrates Stutz belt-driven plating cylinders, includes data on advantageous features. The Stutz Co., 4410 Carroll Ave., Chicago 24, Ill.

114. Stripping Copper
A 10-page booklet describes Liquid Sulphur, tells exactly how to use this material for removing deposits of copper. Sulphur Products Co., Inc., 621 W. Pittsburgh St., Greensburg, Pa.

115. Etch Primer
Data on Gripalloy, an etch primer available in black and colors. Used as primer or finish coat. Tenax Finishing Products Co., Newark 5, N. J.

116. Cob Grit for Blasting, Tumbling
Information on corn cob grits that are used as tumbling media and in blast cleaning. Ti-Co Industries, Inc., P. O. Box 185, Tipton, Indiana.

117. Belt Sanders
A 4-page folder describes Model TOP Timesaver "Speedbelt" Sander. It details the construction features of this unit, gives specifications for four models. Several applications are shown. Timesaver Sanders, P. O. Box 7446, Robbinsdale Station, Minneapolis 22, Minn.

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BARREL FINISHING MEDIA

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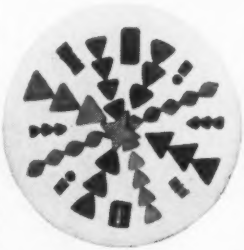

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118. Brass Plating Solution
Technical bulletin on True Brite brass solution, which is available in a variety of colors. True Brite Chemical Products Co., Box 31, Oakville, Conn.

119. Corrosion Resistant Equipment
Bulletin P gives details on corrosion resistant hoods, ducts, fans, plating tanks. du Verre, Inc., Box No. 37-G, Arcade, New York.

120. Colors for Anodizing
Information on dyestuffs for coloring anodized aluminum. Jet blacks, many colors. Rarely require buffering for pH adjustment. Carbic-Hoechst Corporation, 451 Washington St., New York 13, N. Y.

121. Degreaser Lid
Information on the Baron Econ-O-Lid, a roll-type cover which fits all vapor degreasers, is easy to roll open or shut. Baron Industries, 241 W. Avenue 26, Los Angeles 31, Calif.

122. Plastic and Rubber Coatings
Leaflet shows typical applications for Belke rubber and plastic coatings. These coatings are useful in protecting formed wire products, tool handles, chains, conveyor hooks, tote baskets, many other products. Belke Manufacturing Co., 947 N. Cicero Ave., Chicago 51, Ill.

123. Chromic Acid
Information on BFC chromic acid. Better Finishes & Coatings, Inc., 268 Doremus Ave., Newark 5, N. J.

124. Ultrasonic Parts-Cleaning Equipment
A four-page folder shows large Blakeslee ultrasonic degreasers and washers. G. S. Blakeslee & Co., 1844 S. Laramie Ave., Chicago 50, Ill.

125. Tack Cloth
Literature on treated cloths that pick up dust and lint prior to paint finishing. Bond Chemical Products Co., 2639 N. Clybourn Ave., Chicago 14, Ill.

126. Pre-Cut Paint Masks
Bulletin No. 160-c describes and illustrates self-sticking pre-cut protective masks. W. H. Brady Co., 746 W. Glendale Ave., Milwaukee 9, Wisconsin.

127. Buffs
Data sheet describes Buff Type No. 20-RD, a heavy-duty buff made of sisal twine, used for finishing stainless steel, brass and other metals. Geo. R. Churchill Co., Inc., Dept. PF, Hingham, Mass.

128. Centrifugal Deburring and Polishing Machine
Information on the Harperizer, a new machine for quickly producing fine, smooth finishes on parts by processing in loose abrasives without fixtures. Harper Buffing Machine Co., East Hampton, Conn.

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129. Complete Finishing Systems
Catalog No. 200 describes company's design, fabrication and installation services for complete finishing systems. Includes information on equipment for pre-paint treatment, paint application, paint drying and baking, make-up air and exhaust systems. Contains descriptions of typical installations and detailed information on individual components. Cincinnati Cleaning & Finishing Machinery Co., 2021 Hageman St., Cincinnati 41, Ohio.

130. Tips on Ultrasonic Cleaning
Twelve pages. Basic explanation of the process, brief description of equipment required, discussion of proven applications, list of 17 frequently asked questions about ultrasonic cleaning along with the answers. Circo Ultrasonic Corporation, 51 Terminal Ave., Clark, N. J.

131. Advantages of Fused Quartz Ovens
The case for fused quartz ovens is stated in a recent "Clepco News Bulletin" prepared by Cleveland Process Corp. Both theoretical and practical considerations are covered, and absorption curves and charts are included to illustrate the points made. The bulletin discusses reasons for the high efficiencies obtained in the fused quartz ovens manufactured by the company. Cleveland Process Corp., 1773 E. 21st St., Cleveland 14, Ohio.

132. Epoxy Color Pastes and Compounds
Booklet describes Clinton epoxy resin compounds and color dispersions. The Clinton Co., 1210 W. Elston Ave., Chicago 22, Illinois.

133. Rhodium Plating Instructions
Handy pocket-sized booklet gives complete instructions for rhodium plating, includes data on solution preparation, work preparation, temperatures and current densities, tanks, anodes, and so on. Sigmund Cohn Mfg. Co., Inc., 121 S. Columbus Ave., Mount Vernon, N. Y.

33. Aluminum Etchant
Technical data sheet on Cowles AK tells how this formulation works on all aluminum alloys, prevents build-up of scale by means of a special sequestering agent. Cowles Chemical Co., 7016 Euclid Ave., Cleveland 3, Ohio.

134. Bronze Powders
Color card shows 33 colors of bronze-like finishes that can be produced from stock Cres-Lite bronze powders. Crescent Bronze Powder Co., 118 W. Illinois St., Chicago 10, Ill.

135. Metallizing Material
Staples made of extremely pure aluminum and prepared for use in vacuum metallizing are described in literature available from D & W Tool & Findings, Inc., 52 Salem St., Providence 7, R. I.

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LACQUERS • ENAMELS
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CLEAR METAL FINISHES
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CLEAR S.G. FOR METAL
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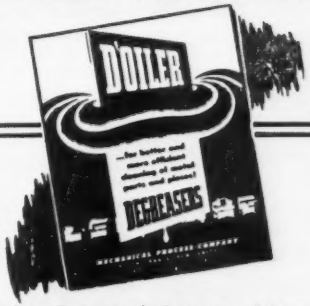

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136. Stripper
Folder describes No. 153 Stripper, a non-flammable volatile solvent-type stripper with very little toxicity. Has excellent penetrating properties, is said to be useful in removing coatings that are difficult to remove, such as melamines, epoxies, vinyls, plating rack coatings. Dytex Chemical Co., 140 India St., Providence 3, R. I.

137. Copper-Brass Treatment
Ebonol "C" improves adhesion of almost every type of coating applied to copper or brass surfaces. It forms thousands of black oxide needles on the surface of the metal, which aid in bonding the paint or other coating to the surface. Also improves corrosion resistance. Complete details available from the manufacturer. Enthone, Inc., 442 Elm St., New Haven 11, Conn.

138. Copper Anode
Information on the new Asarco-Max copper anode. Federated Metals Div., American Smelting & Refining Co., 120 Broadway, New York 5, N. Y.

139. Tack Rags
Four-page folder describes advantages of Detroit Handy Tac Rags. Detro Sales Co., Culver City, Calif.

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140. Hydra-Spray
Four-page folder on the Graco Hydra-Spray, a method of spraying paint in which paint is atomized through a small fluid nozzle by high hydraulic pressure. Gray Company, Inc., 60 - 11th Ave., N.E., Minneapolis 13, Minn.

141. Liquid-Seal Air-Spray Process
An eight-page booklet gives complete information on the liquid-seal air-spray process of painting. This is an air-spray process that is said to utilize 99 per cent of all paint material fed into the system. This folder tells how the process works, what it will do, what equipment is required. The Gyromat Corporation, P. O. Box 600, Fairfield, Conn.

142. Belt Grinder
Bulletin 336-T describes and illustrates Model UBG-50 universal belt grinder, a machine with two heads—one for internal and flexible-belt grinding, one for contact wheel, flexible-belt, platen and contour-wheel grinding. Hammond Machinery Builders, Inc., 1622 Douglas Ave., Kalamazoo, Mich.

143. Impurities in Electroplating Solutions
Technical manual contains a series of reprints which describe the types, sources and effects of impurities in plating solutions, tells how to purify contaminated solutions. Hanson-Van Winkle-Munning Co., Matawan, N.J.

144. Special Spray Equipment
Spray equipment required to apply Glid-Tile, a tile-like polyester finish, is listed and described in catalog sheet M-1052. The finish is said to provide appearance comparable to ceramic tile. This catalog lists the spray guns, tanks, compressors and accessories that have been tested and proved for this application. DeVilbiss Co., Toledo 1, Ohio.

145. Chromium Plating Additive
Information on Diamond CPA 1800, an additive for chromium plating baths which improves throwing power of the solution and metallurgical characteristics of the plate. Diamond Alkali Co., 300 Union Commerce Bldg., Cleveland 14, Ohio.

146. Fans
Bulletin DB 45-58 catalogs a complete line of air-moving equipment, including units specially designed for exhausting corrosive fumes. DeBothezat Fans Div., American Machine & Metals, Inc., East Moline, Ill.

147. Pearlescent Finishes
Information on Nacromer YNC, an additive that is used in standard organic finishes to produce a pearlescent finish. The Mearl Corporation, 41 E. 42nd St., New York 17, N. Y.

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148. Automatic Cleaning Machines
Information on automatic, conveyorized cleaning and metal treating machines. Metalwash Machinery Corporation, 940 North Ave., Elizabeth 4, N. J.

149. Vacuum Metallizing Service
Information on company's vacuum metallizing facilities. Equipment and know-how to handle production runs quickly and efficiently. Metaplast Process, Inc., 34-51 56th St., Woodside, L. I., New York.

150. Plastic-Coating Process, Solventless
Six-page bulletin describes Miccron process for application of plastic resins as protective coatings, using the fluidized bed method. Michigan Chrome and Chemical Company, 8615 Grinnell Ave., Detroit 13, Mich.

151. Painting Machine
Information on the new Gasway Kinetic Kurtain Coater. Gasway Corporation, 6463 N. Ravenswood Ave., Chicago 26, Ill.

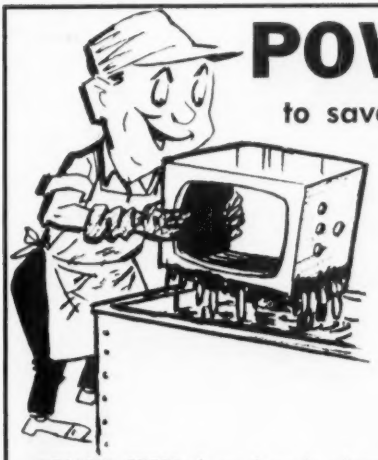
152. Paint Mask
Information on the Flex-A-Prene face mask, which protects the wearer against pigment overspray during painting operations. Lightweight, comfortable, removable filter. Flexo Products, Inc., Westlake, Ohio.

153. Tumbling Media
Information on preformed tumbling media and abrasive products. Over 200 sizes and bonds available. Fortune Industries, Inc., 11770 Dexter Rd., Chelsea, Mich.

154. Oven Sections
Form No. 55-105 is a four-page folder on Radiant Rod oven sections for drying, baking, pre-heating and other industrial heating applications. These units can be assembled and interlocked on the job to form an oven quickly. Fostoria Corp., Huntingdon Valley, Pa.

155. Heat-Fusible Plastisol
Data on new XL-12 heat-fusible plastisol, a formulation that bakes at 365-375 for eight hours without decomposition or color change; is impervious to plating solutions; resists cutting and abrasion. The G. S. Plastics Co., 15573 Brookpark Rd., Cleveland 35, Ohio.

156. Vibrating Barrel Finishing Equipment
Catalog 262 describes and illustrates tumbling equipment that is equipped with a mechanism which vibrates the barrel while it is rotating. Vibration is said to speed the operation, aid in finishing recesses and internal surfaces, reduce distortion, improve descaling, deburring, radii formation, burnishing and coloring operations. Metal Finish, Inc., 410 Frelinghuysen Ave., Newark, N. J.



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experienced in industrial finishing equipment. The Spee-Flo Manufacturing Corporation has two open districts in the Midwest and in the Mountain States, Salt Lake region for men to represent the factory in the sale of hot spray, airless and general line of spray equipment through authorized distributors. Your inquiry treated in confidence. Write Sales Manager, Spee-Flo Company, 6614 Harrisburg, Houston 11, Texas.

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St. Louis, Missouri, metal fabricating plant has opening for foreman. Must have thorough knowledge of bonderizing and reciprocating disc electrostatic painting equipment.

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calling on Metal Working Industries. Eastern chemical manufacturer wants representatives for complete line of metal finishing chemicals including alkali, electro & emulsion cleaners for ferrous and nonferrous metals, ultrasonic cleaners, paint removers, welding specialties, cleaners for printed circuits. Exclusive territory—good profits—technical information and factory support and training. Advise size of selling organization and lines currently handled.
Write Box No. 33, c/o Products Finishing, 431 Main St., Cincinnati 2, Ohio.

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Conveyor Detrex Vapor Spray Degreaser, #325, with Still — approximate size, 25'x12'x6' — good condition. Also, Small Boiler for steam heat, equipped with all controls and condensate. Write or phone Mid-West Chandelier Co., 15th and Gentry Sts., North Kansas City, Mo.; GR 1-4475.

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for technical service representative in Midwest. Emphasis on industrial precious metals processes. Must know cycles, control, layout, trouble-shooting. Extensive travelling. Willing to relocate. State salary. Box No. 34, c/o Products Finishing, 431 Main St., Cincinnati 2, Ohio.

CHEMIST

SITUATION OPEN—Chemist for Plating Laboratory in large finishing Company, Newark, New Jersey. Experience in analysis and control. Reply submitting full resume of experience to Box No. 32, c/o Products Finishing, 431 Main Street, Cincinnati 2, Ohio.

"MECHA-FINISH MACHINE"

Four spindle machine with ten H.P. motors. Complete with all controls. Used very little. Contact Stanley Supply Co., 5208 Sweeney Avenue, Cleveland, Ohio. Phone: BR 1-1733.

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To trouble-shoot in electro-plating operations, conduct chemical analysis, physical testing and some metallographic testing. Also development and quality control work. Must have degree in Chemistry or Chemical Engineering. Plating operation experience desirable but not essential. Write or Call BROWN-LIPE-CHAPIN DIVISION, GENERAL MOTORS CORPORATION, ELYRIA, OHIO.

PAINT AND PAINT SYSTEMS ENGINEER

Will be responsible for all phases of paint materials, paint processes, and paint equipment at mass production plant of growing and progressive appliance company in the middle west. Ideal background would include college degrees in chemical and/or mechanical engineering plus 5 or more years of experience with paints and paint systems. **Starting salary from $7500 to $10,000 plus bonus.** Send resume to Box 35, c/o Products Finishing, 431 Main St., Cincinnati 2, Ohio.

news of the finishing industry

company news
new positions
new plants
meetings

NEW PLANTS

DuBois Opens New Lab

The DuBois Co., Inc. recently moved into its new laboratories in Cincinnati, Ohio. The new laboratories occupy the entire top floor of the DuBois Building, providing convenient study and research conditions for the staff.

Centered about the technical library and conference area, the department includes research and development facilities for the company's various related cleaning products, including spray booth compounds, paint strippers, cleaners and surface conditioners for aluminum and magnesium alloys, ultrasonic-energy degreasing chemicals for industrial components, and other materials.

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The Fuller Brush Company
Anderson Corporation
Dixon & Rippel, Inc.
Braun Brush Co.
M. W. Jenkins' Sons, Inc.
Mason-Worcester Brush Co.
Woonsocket Brush Co.
Spiral Brushes, Inc.
Pittsburgh Plate Glass Co.

Gus Riedel & Son, Inc.
Newark Brush Company
Schaefer Brush Mfg. Co., Inc.
Brushes, Inc.
Malish Brush & Specialty Co.
Better Brushes, Inc.

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William E. Ievoli, Terminal Div., General Motors Corp., described the benefits of using dual chromium plates. Mr. Ievoli's paper showed a significant increase in corrosion resistance from 30 millionths of chromium deposited in two steps, from two different baths, a high temperature, high concentration chromium, followed by a deposit from a fluoride type chromium bath. Under-plates for the chromium deposits consisted of 0.001 inch copper followed by 0.0005 inch nickel on mild steel. The CASS test was used for evaluation.

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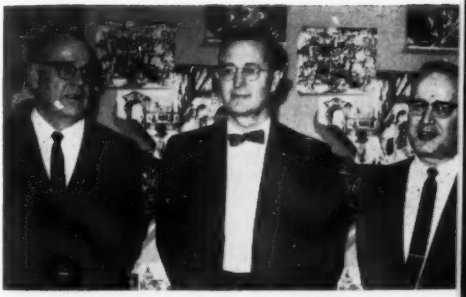

A.E.S. National officers present at the Grand Rapids Annual included Herberth E. Head, Chrysler Corp., past president; Ralph D. Wysong, Studebaker-Packard Corp., president; Chester G. Borlet, Grand Rapids Brass Co., second vice president. (Photographs courtesy Grand Rapids Branch, A. E. S.)

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136. Stripper
Folder describes No. 153 Stripper, a nonflammable volatile solvent-type stripper with very little toxicity. Has excellent penetrating properties, is said to be useful in removing coatings that are difficult to remove, such as melamines, epoxies, vinyls, plating rack coatings. Dytex Chemical Co., 140 India St., Providence 3, R. I.

137. Copper-Brass Treatment
Ebonol "C" improves adhesion of almost every type of coating applied to copper or brass surfaces. It forms thousands of black oxide needles on the surface of the metal, which aid in bonding the paint or other coating to the surface. Also improves corrosion resistance. Complete details available from the manufacturer. Enthone, Inc., 442 Elm St., New Haven 11, Conn.

138. Copper Anode
Information on the new Asarco-Max copper anode. Federated Metals Div., American Smelting & Refining Co., 120 Broadway, New York 5, N. Y.

139. Tack Rags
Four-page folder describes advantages of Detroit Handy Tac Rags. Detro Sales Co., Culver City, Calif.

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140. Hydra-Spray
Four-page folder on the Graco Hydra-Spray, a method of spraying paint in which paint is atomized through a small fluid nozzle by high hydraulic pressure. Gray Company, Inc., 60 - 11th Ave., N.E., Minneapolis 13, Minn.

141. Liquid-Seal Air-Spray Process
An eight-page booklet gives complete information on the liquid-seal air-spray process of painting. This is an air-spray process that is said to utilize 99 per cent of all paint material fed into the system. This folder tells how the process works, what it will do, what equipment is required. The Gyromat Corporation, P. O. Box 600, Fairfield, Conn.

142. Belt Grinder
Bulletin 336-T describes and illustrates Model UBG-50 universal belt grinder, a machine with two heads—one for internal and flexible-belt grinding, one for contact wheel, flexible-belt, platen and contour-wheel grinding. Hammond Machinery Builders, Inc., 1622 Douglas Ave., Kalamazoo, Mich.

143. Impurities in Electroplating Solutions
Technical manual contains a series of reprints which describe the types, sources and effects of impurities in plating solutions, tells how to purify contaminated solutions. Hanson-Van Winkle-Munning Co., Matawan, N.J.

144. Special Spray Equipment
Spray equipment required to apply Glid-Tile, a tile-like polyester finish, is listed and described in catalog sheet M-1052. The finish is said to provide appearance comparable to ceramic tile. This catalog lists the spray guns, tanks, compressors and accessories that have been tested and proved for this application. DeVilbiss Co., Toledo 1, Ohio.

145. Chromium Plating Additive
Information on Diamond CPA 1800, an additive for chromium plating baths which improves throwing power of the solution and metallurgical characteristics of the plate. Diamond Alkali Co., 300 Union Commerce Bldg., Cleveland 14, Ohio.

146. Fans
Bulletin DB 45-58 catalogs a complete line of air-moving equipment, including units specially designed for exhausting corrosive fumes. DeBothezat Fans Div., American Machine & Metals, Inc., East Moline, Ill.

147. Pearlescent Finishes
Information on Nacromer YNC, an additive that is used in standard organic finishes to produce a pearlescent finish. The Mearl Corporation, 41 E. 42nd St., New York 17, N. Y.

Circle numbers on postpaid card opposite page 128 to obtain free literature

148. Automatic Cleaning Machines
Information on automatic, conveyorized cleaning and metal treating machines. Metalwash Machinery Corporation, 940 North Ave., Elizabeth 4, N. J.

149. Vacuum Metallizing Service
Information on company's vacuum metallizing facilities. Equipment and know-how to handle production runs quickly and efficiently. Metaplast Process, Inc., 34-51 56th St., Woodside, L. I., New York.

150. Plastic-Coating Process, Solventless
Six-page bulletin describes Miccron process for application of plastic resins as protective coatings, using the fluidized bed method. Michigan Chrome and Chemical Company, 8615 Grinnell Ave., Detroit 13, Mich.

151. Painting Machine
Information on the new Gasway Kinetic Kurtain Coater. Gasway Corporation, 6463 N. Ravenswood Ave., Chicago 26, Ill.

152. Paint Mask
Information on the Flex-A-Prene face mask, which protects the wearer against pigment overspray during painting operations. Lightweight, comfortable, removable filter. Flexo Products, Inc., Westlake, Ohio.

153. Tumbling Media
Information on preformed tumbling media and abrasive products. Over 200 sizes and bonds available. Fortune Industries, Inc., 11770 Dexter Rd., Chelsea, Mich.

154. Oven Sections
Form No. 55-105 is a four-page folder on Radiant Rod oven sections for drying, baking, pre-heating and other industrial heating applications. These units can be assembled and interlocked on the job to form an oven quickly. Fostoria Corp., Huntingdon Valley, Pa.

155. Heat-Fusible Plastisol
Data on new XL-12 heat-fusible plastisol, a formulation that bakes at 365-375 for eight hours without decomposition or color change; is impervious to plating solutions; resists cutting and abrasion. The G. S. Plastics Co., 15573 Brookpark Rd., Cleveland 35, Ohio.

156. Vibrating Barrel Finishing Equipment
Catalog 262 describes and illustrates tumbling equipment that is equipped with a mechanism which vibrates the barrel while it is rotating. Vibration is said to speed the operation, aid in finishing recesses and internal surfaces, reduce distortion, improve descaling, deburring, radii formation, burnishing and coloring operations. Metal Finish, Inc., 410 Frelinghuysen Ave., Newark, N. J.

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Write Box No. 33, c/o Products Finishing, 431 Main St., Cincinnati 2, Ohio.

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news of the finishing industry

company news
new positions
new plants
meetings

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Highlights of Chicago Branch, A. E. S., 48th Annual Meeting

Platers attending the educational session at the 48th Annual Meeting of the Chicago Branch A. E. S. on January 30 at the Conrad Hilton Hotel heard both praise and caution from the speakers on the three-man panel. Handing out the bouquets were automotive-industry spokesmen Joseph Gurski of Ford and Cleveland F. Nixon of General Motors. The yellow light came from Leonard Weeg, National Lock Company, speaking about the appliance and non-automotive applications of plating.

Joe Gurski, manager of Chemical and Metallurgical Laboratory Service at Ford Motor Company, began the excellent program. Better processing and testing procedures for both anodized parts and plated parts have resulted in upgrading of quality to the point where significant improvement is expected when product-evaluation tests are conducted on automobiles in service this year, Mr. Gurski reported.

Aluminum parts, for example, now must have an anodic coating of 0.0003 inch minimum thickness to meet Ford specs. The anodic coatings also have to pass tests for density of coating and adequacy of sealing to get the stamp of approval.

Plated parts for Fords now face the tougher Corrodkote Test, rather than the A.S.T.M. salt spray test that was specified through 1958.

Mr. Gurski regards this change as a definite step forward, credits it with

Fig. 1—Simon P. Gary, Scientific Control Laboratories, Inc., educational program chairman for Chicago meeting, calls the meeting to order. Mr. Gary introduced Ralph D. Wysong, manager of manufacturing research at Studebaker-Packard Corp., and president of the A. E. S., who served as moderator.

Fig. 2—Participants in the panel discussion entitled New Plating Methods and Specifications included (left to right) Leonard Weeg, Joseph Gurski, and Cleveland F. Nixon, and the moderator, Ralph D. Wysong who is president of the A. E. S. this year.

helping to bring about the quality improvement that the company expects to find when the evaluation team gets out and checks the plating on this year's models for corrosion.

While conventional salt spray was not entirely invalid as a quality measure, Mr. Gurski said, it did require too much time. Thus changes in production procedures that might up

Fig. 3—Representatives of the Midwest Regional Council, A. E. S., met prior to the Chicago Technical Session. Branch representatives present included A. E. S. Past President Clyde Kelly, Dr. R. E. Harr, R. Scott Modjeska, Paul Glab (Council secretary-treasurer), Chicago Branch; L. L. Diveley (Council president, Ted Sobczynski, Herman Tessmann, Henry Bornitzke, Frank Marshall, S. Taterzynski, Milwaukee Branch; Lloyd Gilbert, George Parisho, Mississippi Valley Branch; A. E. S. President Ralph D. Wysong, Eugene Roth (Council vice president), Ralph Brouwer, St. Joseph Valley Branch; William Geissman, Murray Rounds, Harold Ellis, Rockford Branch; and William George of the St. Louis Branch.

Fig. 4—Job platers were entertained at a luncheon sponsored by Udylite Corporation during the Chicago meeting. Theme of the luncheon gathering was "Udylite Around the World in 40 Years." Larry George introduced Udylite executives, sales representatives.

corrosion resistance took too long to evaluate. This slowed the transition from laboratory to production use of new processes. Likewise, he said, vendors could not check their products quickly enough in production.

The 1959 model year was the transition period at Ford: from salt spray to Corrodkote. Fifteen per cent corrosion on any one area of a part that had been through the Corrodkote tests became cause for rejection. Result: 18 per cent of parts were found unsatisfactory, Mr. Gurski reported.

By the time the 1960 model year rolled around, platers of Ford parts were more familiar with Corrodkote Result: this year rejection rates are down to four per cent.

"If field-survey results are as good as these accelerated-test results, we feel that control of brightwork corrosion is within reach," Mr. Gurski told his audience.

Fig. 5—Udylite representative demonstrates new Udylok-Tempron plating cylinder. Interlocking construction makes it possible to disassemble barrel, quickly put in new panel when repair becomes necessary in service. Replacement of damaged part and return to production takes less than half hour, requires only screw driver and hammer.

To demonstrate that the new test is tougher than the old test, the Ford spokesman showed results of tests performed on duplicate samples. Reject rate was 22 per cent on parts that served time in Corrodkote, only 16 per cent in standard salt spray.

Better plating procedures deserve credit for some of the improvement, too, Mr. Gurski pointed out, and Ford specs now take into account the processes which result in improved corrosion resistance. Duplex nickel on zinc die castings, for example, shows a lower reject rate on parts in service in the Detroit area. Therefore, the specs now say that a plater who uses the double nickel coating can plate 0.0002 inch less nickel on his parts and still pass thickness requirements.

Speaking of competing brightwork systems, Mr. Gurski said that the various types of brightwork must be evaluated on the basis of what they can do and how efficiently they can do it. Each has things it can do better than competing systems. If quality is equal, then economics becomes the prime consideration, he said.

"We have found," Mr. Gurski said, "that anodized aluminum is not a panacea. And our surveys show that we must take a closer look at rustless steel also," he continued.

But aluminum and plastics will continue to replace zinc die castings for certain applications where a colored finish is required, for interior parts, and for other applications where qualities of these other materials are desirable, Mr. Gurski said.

Naturally, if better plating or anodizing systems are developed, they will be in a preferred position competitively. But higher-priced materials will be used only where there is a definite quality advantage, Mr. Gurski reminded his audience.

Cleve Nixon, head of the Electrochemistry Department, General Motors Research staff, agreed with Mr.

Gurski that reliable, fast corrosion tests have been important in improving durability, also gave credit to duplex nickel and thicker chromium for the lessening of corrosion problems.

While GM still specifies thickness (1.5-2.0 thousandths total, 10 mils chromium minimum, for outdoor corrosion resistance) the emphasis is now on passing the corrosion tests. Parts for GM cars must withstand 16 hours in the CASS test to be acceptable.

Mr. Nixon suggested caution in using the tests for evaluating other types of products —especially in testing durability of aluminum and stainless steel.

Results from the CASS tests more nearly duplicate outdoor exposure results when parts are cleaned with magnesium oxide before the test. But cleaning with alumina or silica can be done without important differences in the results, Mr. Nixon noted.

The GM representative described results of experiments performed in the company's laboratories in an attempt to explain the improved corrosion resistance of parts plated with heavier chromium.

To perform these tests, samples in the CASS test cabinets were placed so that condensate runoff during the test could be collected and analyzed.

Results of these tests showed that very little corrosion of chromium took place, but appreciable nickel could be found in the runoff. Therefore one might conclude that this is the explanation for increased corrosion resistance from heavier chromium deposits, Mr. Nixon said.

Further experimentation does not

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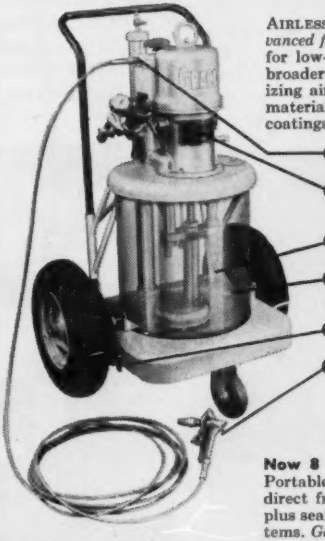

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bear out this conclusion, however. Parts that failed early in the test produced condensates with little nickel, while those that failed late had greater amounts of nickel, he reported.

In analyzing condensate which came from parts that failed in 16 hours, GM researchers found that only three milligrams of nickel showed up in the condensate after 48 hours; on a piece that failed only after a much longer period, the analysis showed 17 milligrams of nickel in the concentrate. These results were for test specimens on which there was no chromium—just a bare nickel plate.

On a specimen plated with 46 millionths of chromium over the nickel, no corrosion took place after 96 hours, but 17 milligrams of nickel showed in the concentrate—almost as much as for plain, unplated nickel.

In the light of these findings, it would seem that thick chromium plates have many small openings, but penetration is retarded. When the chromium plate is thinner but relatively continuous, fewer regions are attacked, but rate of attack is higher.

Thus it would seem that an impervious deposit of chromium would enhance durability; Mr. Nixon noted however, that such deposits had not been found, as far as this research work has gone.

He concluded that not all duplex nickel or heavier chrome is necessarily good and that accelerated testing is important in determining performance quality.

Leonard Weeg, superintendent of the Finishing Department, National Lock Company, pleaded for "sanity in writing plating specifications."

"What is good for one segment of the plating industry, is not necessarily good for the rest of the industry," Mr.

Fig. 6—L. K. Lindahl, chairman of the board, Udylite Corporation, described his trip to Europe, told about plants over the world using Udylite products and equipment, reviewed dynamic overseas plating business. Movie shown pictured modern plant in Italy where Fiat is built, with Udylite plating equipment in action.

Fig. 7—Fiat automobile came to luncheon as representative of Udylite overseas. The Italian guest entered through the Conrad-Hilton's kitchen, the only route open for such an unusual visitor. Ralph Kwarsick, sales engineer from Udylite's Chicago office, maneuvered Mr. Fiat through maze of pots and pans. (PRODUCTS FINISHING Photographs.)

Weeg pointed out. Quoting statistics which show that 62 per cent of nickel plating is for automotive uses and 38 per cent for other applications, he noted that sellers from the 38 per cent group (non-automotive) have been zealous in recent years in pointing out the corrosion tests their products will withstand.

When you add to the cost of plating to increase corrosion resistance of products where corrosion resistance has not been a problem, this hurts the industry, Mr. Weeg said. Why? Because this adds cost, makes it easier for competitive processes to make inroads.

For zinc die castings, 0.0002 of copper plus 0.0003 nickel plus a chromium flash is adequate, will give good service until someone takes a part meant for indoor service and puts it outside on the chicken house, plater Weeg said.

Rather than increase cost by specifying corrosion resistance that isn't really needed, Mr. Weeg thought platers would do well to increase efforts on quality control and research to make sure that parts are *well plated.*

Basic work is needed in cleaning, plating cycles, post-treatment cycles, and use of automated and semi-automated equipment; greater instrumentation is needed so that cleaning and plating cycles can be truly automatic; and more work is needed on the operation and control of the humidity cabinet. These things are more important than increasing corrosion resistance, Mr. Weeg concluded.

Questions directed at the partici-

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pants in this program revealed concern among some members of the audience (Les Diveley) that the salt spray test has been discredited, but no suitable test has been suggested to take its place for non-automotive products. Work is needed on a test that can be used to predict service of finishes other than copper-nickel-chrome plating, the questioners felt.

Dr. E. B. Saubestre questioned the amount of tolerance now allowed in collection rates when using the new corrosion tests. Collection rate now specified is 1½ plus or minus ½ ml. (or, in effect, 1-2 ml.). This might lead to difficulty in reproducibility, said Dr. Saubestre. Speaker Nixon said, however, that correlation in different G. M. installations has been good, feels that the restriction now placed on collection rate is strict enough.

Kansas City Branch, A. E. S., Inaugurates Annual Ladies' Night

On February 13 the Kansas City Branch held its first dinner meeting for members and their wives.

After a social hour and dinner of famed Kansas City steak, members

Fig. 8—The Metal Finishing Suppliers' Association held a meeting of the Board of Trustees, chairmanned by President Ray F. Ledford, Chemray Corp., on Jan. 30. Trustees Fred P. Green, Crown Rheostat & Supply Co. (1st vice president); Dr. H. L. Kellner, Lea Mfg. Co. (3rd vice president); Ezra A. Blount, "Products Finishing," (treasurer); E. W. Couch, Lea Mfg. Co. (past president); Eugene L. Combs, Diamond Alkali Co.; L. A. Davies, Davies Supply & Mfg. Co.; A. B. Hoefer, Frederic B. Stevens, Inc.; Robert M. Norton, Hanson-Van Winkle-Munning Co.; John E. Trumbour, Metals & Plastics Publications; A. P. Munning, Munning & Munning, Inc. (executive secretary) were present for the meeting. Plans for M.F.S.A. events at the Los Angeles A. E. S. Convention were discussed with Herman J. Struckhoff, Laco Eng. & Sales Co., an M.F.S.A. past president and present liaison representative for the Los Angeles Convention. Also present were former trustees George A. Stutz, Stutz Co.; George H. Huenerfauth, Crown Rheostat & Supply Co., and C. C. Helmle, Enthone, Inc. Harold W. Baker, Electro Galvanizing Co., was the liaison representative from the National Association of Metal Finishers. (Photo courtesy "Plating".)

February 13 dinner meeting of Kansas City Branch. At head of table (background) are: (left to right) Scott Sterrett, Bendix Aviation Corp., president of Kansas City branch; Mrs. Blount; Ezra A. Blount, PRODUCTS FINISHING; Mrs. Elliot; Warren Elliot, Eastside Plating Co., branch vice president. (Photograph courtesy Kansas City Branch.)

and guests heard Ezra A. Blount, editor of PRODUCTS FINISHING, describe briefly what plating is all about, and where it is used on today's products. Principal speaker of the evening was Mrs. Ezra Blount, who described her trip to Europe, mentioning the various countries visited and some of the points of interest. The talk was illustrated by color movies and a display of some of the products purchased in the countries visited.

Philadelphia Branch A. E. S. Holds Successful 50th Anniversary Celebration

Two technical sessions, a plant tour of American Machine and Metals, Inc., meetings of several A. E. S. committees, the 7th Interim Meeting of the A. E. S., and a full program of entertainment brought some 400 A. E. S. members and guests to the Benjamin Franklin Hotel, Philadelphia, on February 19 and 20.

47th Annual Convention

American Electroplaters' Society

Los Angeles, California • Statler Hotel • July 24-28

More than 30 papers • Ladies' Program • Children's Program
Plant Tours • Entertainment • Sightseeing

Fig. 1—James E. Cogan, Jr., Globe Electro Plating Co., president of the Philadelphia Branch, opens the 50th Anniversary meeting of the branch. Shown (left to right) are: I. William Marcovitch, American Machine & Metals Co., Inc., secretary; John B. Winters, Incar, Inc., speaker; Joseph W. Berenato, Jr., of J. Berenato, librarian; Dr. Samuel Heiman, Philadelphia Rust Proof Co., technical-session chairman; Mr. Cogan; (Ralph D. Wysong, Studebaker-Packard Corp., A.E.S. president, and Dr. W. Andrew Wesley, International Nickel Co., Inc., A.E.S. 1st vice president and a speaker, are hidden by the Philadelphia Branch Charter and the letter of tribute from the mayor of Philadelphia) Chester G. Borlet, Grand Rapids Brass Co., A.E.S. 2nd vice president; Manuel Ben, General Motors Research Staff, A.E.S. 3rd vice president; Herberth E. Head, Chrysler Corp., A.E.S. past president; and John P. Nichols, executive secretary of the American Electroplaters' Society.

Fig. 2—Speakers and technical chairmen for 2nd technical session, the "Aluminum Symposium." Shown (left to right) are: Joseph W. Berenato, Jr., J. Berenato, assistant technical chairman; Russell V. Vanden Berg, Alcoa Process Development Laboratories; Dr. Harold J. Wiesner, Bendix Aviation Corp.; William K. Murray, manager of marketing, Enthone, Inc.; Dr. Samuel Heiman, Philadelphia Rust Proof Co., technical-session chairman. The original charter of the Philadelphia Branch, issued in May, 1909, is signed by George B. Hogaboom, who was then president of the American Electroplaters' Society.

The A. E. S. Executive Board met with the trustees of the Metal Finishing Suppliers' Assn., Inc., in an informal session to exchange ideas and consider matters of mutual interest in connection with the A. E. S. Convention to be held in Los Angeles July 24-28. Tony Stabile, general chairman of the Los Angeles Convention, was on hand to provide up-to-date information on plans and progress.

In the first technical session (Fig. 1) A. E. S. 1st Vice President Dr. W. Andrew Wesley, International Nickel Co., Inc., reviewed "The Search for the Causes and Remedies for Corrosion of Nickel-Chromium Coatings." John B. Winters, Incar, Inc., discussed "Bright Zinc and Cadmium."

The second technical session (Fig. 2) was an Aluminum Symposium. R. V. Vanden Berg, Alcoa Process Development Laboratories, discussed "Anodizing and Chemical Finishing of Aluminum." Mr. Vanden Berg emphasized the fact that every alloy constituent particle in the surface of an aluminum alloy affects the appearance of the anodic film. Silicon produces a gray shade, chromium a yellow coloration, and manganese a brown tint, when alloys containing those metals are anodized. Correct chemical and electrochemical pretreatment is essential to produce the brightest possible surface on anodized aluminum, he said.

Dr. H. J. Wiesner, Bendix Aviation Corp., a past president of the St. Joseph Valley Branch, A. E. S., considered the four principal methods of

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"Hard Anodizing." He pointed out that a hard anodized part had to perform in service as well as hardened steel or hard-chrome-plated steel. Dr. Wiesner discussed wear-testing methods and reported test results that showed hard anodized aluminum to be harder than steel.

William K. Murray, manager of marketing, Enthone, Inc., a past president of the New Haven Branch, A. E. S., and an instructor in electroplating at New Haven College, discussed "Plating on Aluminum."

Mr. Murray exhibited samples showing several applications for plated aluminum products: small engine piston nickel and hard chrome plated; tractor engine part hard chrome plated to 0.01 inch thickness; quarter-hard aluminum wire copper and lead-tin plated (for solderability); aluminum bus bar silver plated to lower contact resistance; carving set bright nickel and chrome plated.

A typical processing cycle for tin plating an aluminum part was outlined:

1. Rack firmly using spring contacts.
2. Vapor degrease or solvent clean.
3. Etch clean.
4. Thorough water rinse.
5. Nitric acid dip. Certain alloys may have to be dipped in mixtures of nitric acid with hydrofluoric and/or sulfuric acids.
6. Thorough water rinse.
7. Dip in sodium zincate bath. Usual temperature 60 to 75 deg. F. Time: 5 to 30 seconds.
8. Water rinse.
9. Copper strike in Rochelle copper cyanide bath. pH 10.5. Free cyanide less than 0.5 oz./gal.
10. Water rinse.
11. Tin plate. (Or continue with any other plating cycle.)

Arizona Metal Finishing Symposium and Industrial Exhibition

The Phoenix Branch of the American Electroplaters' Society will sponsor the First Arizona Metal Finishing

Fig. 3—Delegates' luncheon was a welcome break between sessions of the 7th Annual A.E.S. Interim Meeting, held in Philadelphia on February 20. (Photographs by PRODUCTS FINISHING.)

Symposium and Industrial Exhibition at Arizona State University on Saturday, March 26.

The program will include several papers on finishing procedures and techniques.

Industries throughout the state will exhibit at the Industrial Exhibition.

For reservations, write Paul Wible, general chairman, 3622 E. Sheridan, Phoenix, Arizona.

Industrial & Engineering Fair to be Held in Buffalo

Sponsored by the Technical Societies Council of the Niagara Frontier, an Industrial & Engineering Fair will be held in the Buffalo Memorial Auditorium, Buffalo, New York, on April 19, 20, 21. The Council is composed of 36 technical societies, one of which is the Buffalo Branch of the American Electroplaters' Society.

The Fair will include exhibits of equipment, products and services of many of the companies in the industries represented by the sponsoring societies. Full information regarding contracts for exhibit space, names of exhibiting companies, and so on, may be obtained from Ralph Simonette, Technical Societies Council of the Niagara Frontier, Room 62, Hotel Statler-Hilton, Buffalo 2, N. Y.

Cincinnati to Host Tri-State Regional Meeting in April

An expanded educational session will highlight the Sixth Annual Tri-state Meeting of the American Electroplaters' Society. Morning and afternoon sessions will be a new feature for this meeting which will be held on Saturday, April 23, at the Sheraton-Gibson Hotel in Cincinnati.

The interesting educational program planned is expected to bring out more operating and technical personnel than have attended any previous Tri-State meeting, according to Lee J. Howald, Harshaw Chemical Company, general

Lee J. Howald

George E. Barnes

chairman. "Anyone who attends this meeting seriously intending to increase his knowledge of plating, will leave the meeting well satisfied," Mr. Howald commented.

David L. Kaplan, Electric Auto-Lite Company, is chairman of the committee planning the educational sessions. Ralph D. Wysong, Studebaker-Pack-

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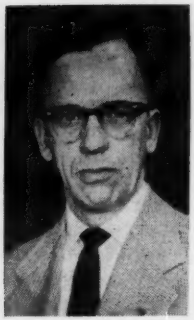
ard Corporation, president of the A. E. S., will be honorary chairman. Mr. Kaplan reports that his plans are almost complete, with the program including five papers:

1. 11:30 A.M. *Personnel in Plating* by Robert L. Giesel, president, Adolph Plating, Inc., Chicago. Mr. Giesel will show the testing procedures his large job plating shop employs for selecting employees. He will also describe his company's plan for motivating employees.
2. 12:10 P.M. *Corrosion Resistance of Decorative Plates,* by James D. Thomas, senior research engineer on electroplating research, General Motors Research Laboratories, Detroit. Mr. Thomas will discuss the research program sponsored by the A. E. S., which is producing information of value in improving corrosion resistance of decorative electroplates. Results of outdoor exposure tests by A.S.T.M. Committee B-8 will be discussed as to their effects on the several variables included in the program. The thinking of the Society of Automotive Engineers in writing specifications for plating which put all corrosion tests as a principal consideration and plate thickness as secondary, also will be discussed.

Robert Giesel

Dr. Abner Brenner

John F. Harper



James D. Thomas

3. 2:00 P.M. *Waste Disposal,* by George E. Barnes, consultant and professor of hydraulic and sanitary engineering, Case Institute of Technology. Professors Barnes and Weinberger will show the work they have done and the methods they have used in setting up and improving waste treatment facilities in the plating industry. Working on the premise that waste destruction is no longer the sole answer to the problem, they have redesigned production facilities to improve quality of the work turned out and to secure more concentrated rinses. From these concentrated rinses, metals and cyanides can be recovered either by direct reclaim of first rinses or by means of such devices as ion-exchange, dialysis, evaporation, or these methods in combination with others. Case histories will be included to illustrate installations of interest to operators of large and small plating shops.
4. 2:40 P.M. *The Harperizer—A New and Fresh Approach to Problems of Mechanical Finishing,* by John F. Harper, president, Harper Buffing Machine Co., East Hampton, Conn.
5. 3:10 P.M. *A Visit to Moscow,* by

Dr. Abner Brenner, chief of the Electrodeposition Section, National Bureau of Standards, Washington, D. C. Dr. Brenner will describe his visit to the Soviet Union, where he attended the Conference on Protection and Corrosion of Metals. Most of the talk will be non-technical and will be concerned with Dr. Brenner's general impressions of the Russians and their city. Illustrated with slides.

The Tri-State region of the American Electroplaters' Society includes the Cincinnati, Dayton, Indianapolis, Louisville and Columbus branches, one of which is host each year for the annual meeting.

More than 300 platers and suppliers are expected to attend the meeting, which will conclude with an evening cocktail party sponsored by suppliers, and a dinner dance. The ladies will socialize in the hospitality suite hosted by the Cincinnati Branch while their men attend the educational sessions.

Another innovation at this year's Tri-State meeting will be a special reduced registration fee ($3.00 per person) for those who wish to attend educational sessions only and cannot stay for the evening festivities. The regular registration fee ($9.50 per person) includes everything—educational sessions, banquet and dance.

Tickets for the Tri-State Meeting may be ordered from Richard K. Evans, Bill Young & Co., Inc., 1843 N. Reading Road, Cincinnati 15, Ohio.

Milwaukee Branch A.E.S. Annual Meeting

The Milwaukee Branch of the American Electroplaters' Society will hold its Annual Educational Session and banquet on April 30 at the Hotel Schroeder, Milwaukee.

Luncheon at 12:00 Noon will be followed by the educational session, which begins at 1:15 P.M. Lloyd Gilbert of Rock Island Arsenal will speak on *How Design Influences Finishing or Things that Shouldn't Happen to a Metal Finisher*. Mr. Gilbert's talk will be followed by a workshop session on finishing problems.

The meeting will conclude with banquet and entertainment, beginning at 7:00 P.M.

NEW POSITIONS

The appointment of two executives of **Diamond Alkali Company**, Cleveland, Ohio, to new management assignments was announced recently.

Frank Chrencik, general manager of the Electro Chemicals Division for the past four years, has been named vice president-manufacturing.

Arthur B. Tillman, operations manager of the Electro Chemicals Division since January 1957, will succeed Mr. Chrencik as general manager of the Electro Chemicals Division.

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Gabriel F. Doria appointed technical representative of **The U. S. Stoneware Co.** Mr. Doria will work out of U. S. Stoneware's New York City offices, 60 East 42nd St.

The Hubbard-Hall Chemical Company appointed **Robert F. Morriss** as metal finishing and supply field representative in New Jersey and metropolitan New York.

Gabriel F. Doria

H. Stirling Blair

Roy A. Hoegh

Robert F. Morriss

Metal Finish, Inc., Newark, N. J., appointed **H. Stirling Blair** manager of sales and service engineering.

The Stutz Company, Chicago, Illinois, has announced the addition of **Roy A. Hoegh** to the executive staff. Mr. Hoegh will serve as manager of the Plating Barrel Division of the company, and will also serve as special assistant to Mr. Stutz.

★ ★ ★

John W. Baggott appointed chief process engineer for the Paint and Brush Division of **Pittsburgh Plate Glass Company.**

Mr. Baggott succeeds **C. R. Holman** who has been named manager of the company's Springdale (Pa.) factory.

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Ira R. Livingston elected executive vice president in charge of sales, **Chemclean Products Corporation.**

★ ★ ★

D. L. Bohon appointed manager of industrial sales for **The DeVilbiss Company.**

E. F. Frey, who has been manager of industrial sales, will continue to serve as sales liaison officer between the industrial and jobber sales divisions and take on the additional duties of correlating sales efforts on DeVilbiss Metal Fabricators products.

Richard McDowell

D. L. Bohon

Frederick Gumm Chemical Company has named **Richard McDowell** as a technical sales representative for its line of Clepo plating and metal finishing compounds in southern and northwestern Ohio. The new sales territory will include the cities of Cincinnati, Columbus, Toledo and Dayton.

★ ★ ★

Robert F. Poyton recently appointed sales and service representative in the New England area by the **Neilson Chemical Company,** Detroit, Michigan.

★ ★ ★

Industrial representative **Paul F. Reddy** is a recent addition to the Boston District staff of **Wyandotte Chemicals' J. B. Ford Division.**

Henry B. Koehler

Paul F. Reddy

Hanson-Van Winkle-Munning Company, Matawan, N. J., appointed **Henry B. Koehler** manager of electrical sales.

★ ★ ★

Kenneth W. Marty, senior chemist in the Planning & Economics Section of **Diamond Alkali Company's** Research Department, Painesville, Ohio, has been promoted to the Technical

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Service Staff of the Chlorinated Products Division, Cleveland.

At his new post, Mr. Marty assumes responsibility for technical service to Diamond customers in the Solvents and Chlorowax fields.

★ ★ ★

Three executive appointments in **Allied Chemical Corporation's Solvay Process Division** have been announced: **John B. Green** becomes assistant to the president, **Dr. Robert H. Reed** is named director of development and **C. Russell Hall** is appointed division comptroller.

COMPANIES

Polymer Corporation Forms Two New Divisions

The Polymer Corporation has formed two new divisions, "designed to provide separate identity for the company's extensive sales development and service engineering for its new coating system and new basic resins," according to Louis L. Stott, president.

The new divisions are designated as the Whirlclad Division and the Molding Resins Division. Douglas L. Cochran will head the Whirlclad Division as general manager, and Thomas E. Powers will be sales manager of the Molding Resins Division, Mr. Stott said.

The Whirlclad Division will assume all the activities of National Polymer Products, Inc. — now being discontinued as an active subsidiary of the company—which are related to the Whirlclad Coating System and to the manufacture and sale of Corvel fusion bond finishes.

The Molding Resin Division will assume those activities of National Polymer Products, Inc. which are related to Nylatron and Nylasint molding compounds.

Lead Industries Association Elects Vuillequez Vice President

The Lead Industries Association has announced the election of Jean Vuillequez, vice president of American Metal Climax, Inc., as president, chairman of the board of directors, and chairman of the executive committee of the Association.

Lowe Representatives Hear About New Paints

All industrial finishes representatives of The Lowe Brothers Company recently gathered at the firm's general offices to begin a four-day sales conference.

Purpose of the meetings, said E. F. Teyber, Industrial Division manager, was to introduce six new industrial finishing products.

The products introduced include a primer being introduced for resistance to the elements; a flexible coating for aluminum siding on houses, can coating, toothpaste tubes, etc.; an entire machine tool finishes line capable of

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withstanding new water-soluble coolants; a hard, tough coating for business machines and other equipment which must withstand abrasion; water-reducible coatings which eliminate fire hazards during application; and a multi-colored finish which produces two colors in one application.

Microbeads, Inc. To Add Distributors

Microbeads, Inc., subsidiary of Cataphote Corporation, maker of microscopic glass beads used in blasting is expanding its list of industrial distributors to serve the growing market for this product.

Sales of glass beads to industry approximately tripled last year, according to Jack E. Fagala, general manager and marketing director of Microbeads and Cataphote Corporation. Part of this growth was extension of use in cleaning and blasting, and part in new uses discovered by industrial research departments and through the contest conducted by Microbeads last year.

Use of the Microscopic glass beads has been found particularly advantageous in cleaning and blasting by various wet and dry methods.

Liquid Buffing Compound Symposium Held at American Buff Co.

A lecture-demonstration of correct application of liquid buffing compounds was presented by Ralph Hale, general manager of J. J. Siefen Co., Detroit, to executives and regional sales engineers of American Buff Co. at the American Buff plant in Chicago on January 29. Mr. Hale was assisted by Alfred Darnell, technical service engineer, J. J. Siefen Co.

Mr. Hale reviewed the history of liquid buffing compound application,

On hand for liquid buffing compound symposium were American Buff Company's Ben P. Sax, chairman of the board (right center of photo), Stanley Sax, Leonard Sax, Marv Radom, Harry Pink, Ed Hoyle, David Atkins, Morrie Tychman, Dave Nakashima, Jim H. Bacha, Ron Greiner, Murray Paley, Garold Swartz, and Syl Mock. Ralph Hale and Al Darnell, J. J. Siefen Co., are at right (without coats). (PRODUCTS FINISHING Staff Photo.)

covering the evolution of equipment used. Recommendations for equipment and methods encompassing today's best practice were made.

The speaker's points were all illustrated graphically on charts. Exhibits of spray guns, valves, compound tanks, and other items of equipment aided the speaker in his discussion of the correct use of proper and adequate equipment for applying liquid buffing compounds.

Two Manufacturers' Agents Named by Delavan Manufacturing Co.

The Delavan Manufacturing Company has appointed two manufacturers agents to serve as sales representatives for Delavan's line of Industrial Spray Nozzles.

Hart Pump Engineering Company, P. O. Box 286, West Hartford 7, Connecticut will represent Delavan in Connecticut, Rhode Island and West Massachusetts.

Westco Pump Sales Company, 85 Industrial Street, San Francisco, California will sell the Delavan line in California, Nevada and Arizona.

Chemray Corp. Represents Cowles Chemical in Chicago

Chemray Corporation, Westchester, Illinois, will sell Cowles metal finishing chemicals in Chicago, providing additional coverage and service in this area, until now handled exclusively for Cowles by Allied Research Products, Inc. Allied will continue as a Cowles dealer.

The two dealers are supported with technical assistance by Cowles' George Egger, midwest division manager and Bob Sauter and Ken Deerwester, Cowles technical men, who work on metal cleaning problems in customer plants.

Raymond F. Ledford is president of Chemray Corporation.

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Patent Office Display Includes Finishing Inventions

Suppliers of finishing chemicals are among the companies that will display at the Chemicals and Synthetics Exhibit, being held from February 15 to March 11 in the Department of Commerce Lobby, Washington, D. C.

The exhibit will show many technological advances made by inventors in the chemical field under the American Patent System.

Companies that will display include Amchem Products, Inc., American Viscose Corporation, Arnold Hoffman & Co. Inc., Chemical Process Co.,

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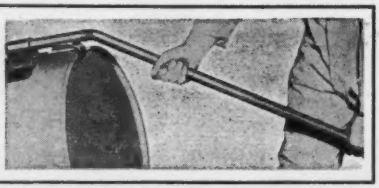

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Conax Corporation, Diamond Alkali Company, E. I. du Pont de Nemours & Co. (Inc.), Food Machinery & Chemical Corporation, General American Transportation Corporation, Lea-Ronal, Inc., National Lead Co., Office of Naval Research, The Permutit Company — A Division of Pfaudler Permutit Inc., U. S. Army Chemical Corps, United States Insulation Co., U. S. Vitamin and Pharmaceutical Corp., Vitro Corporation and Sheer-Korman Associates, Inc.

TRAINING COURSES

Plating Short Course at Virginia Polytech

Dr. Nelson F. Murphy will conduct a short course in electroplating at Virginia Polytechnic Institute this spring. Organization depends upon the number of people who attend. All interested persons should contact Dr. Murphy at Box 104, Blacksburg, Va.

NECROLOGY

Edward M. Falk

Edward M. Falk, sales manager of The W. W. Sly Manufacturing Company, died on January 8, 1960.

Mr. Falk, 51, had been with the Cleveland company for 22 years.

MEETINGS of INTEREST to FINISHERS

Mar. 12. Annual Banquet and Educational Session, Rockford Branch, A.E.S., Faust Hotel, Rockford, Ill.

Mar. 14-18. 16th Annual Conference and 1960 Corrosion Show, National Association of Corrosion Engineers, Dallas, Texas.

Mar. 26. First Arizona Metal Finishing Symposium and Industrial Exhibition. Sponsored by Phoenix Branch, A.E.S., Arizona State University, Tempe, Arizona.

Apr. 7-8. 41st Annual Meeting, Galvanizers Meeting, American Zinc Instute, Inc., Chase-Park Plaza Hotels, St. Louis, Mo.

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Apr. 9. Annual Meeting, Baltimore-Washington Branch, A.E.S., Marty's Park Plaza, Baltimore, Md.

Apr. 23. Sixth Annual Tri-State Meeting, A.E.S., Cincinnati Host Branch, Sheraton-Gibson Hotel, Cincinnati, Ohio.

Apr. 23. 21st Annual New England Regional Meeting, Hotel Statler, Hartford, Conn.

Apr. 26-30. Annual Spring Conference, Institute of Metal Finishing, Inc., Grand Hotel, Scarborough, England.

Apr. 30. Annual Meeting and Banquet, Milwaukee Branch, A.E.S., Schroeder Hotel, Milwaukee, Wis.

Apr. 29-30. Sixth Empire State Regional Meeting, Southern Tier Host Branch, Mark Twain Hotel, Elmira, New York.

May 1-5. Spring Meeting, The Electrochemical Society, LaSalle Hotel, Chicago, Ill.

July 24-28. 47th Annual Convention, A.E.S. (National), Hotel Statler, Los Angeles, Calif.

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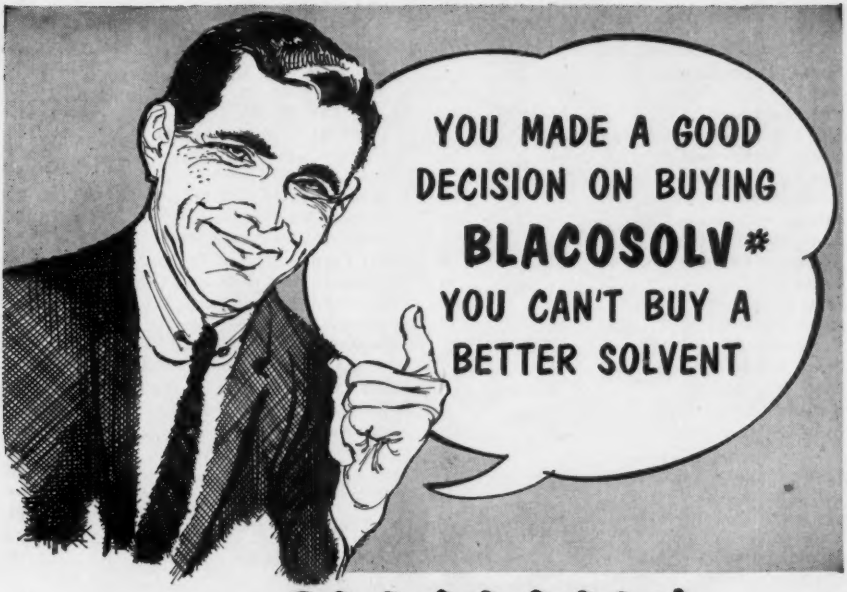

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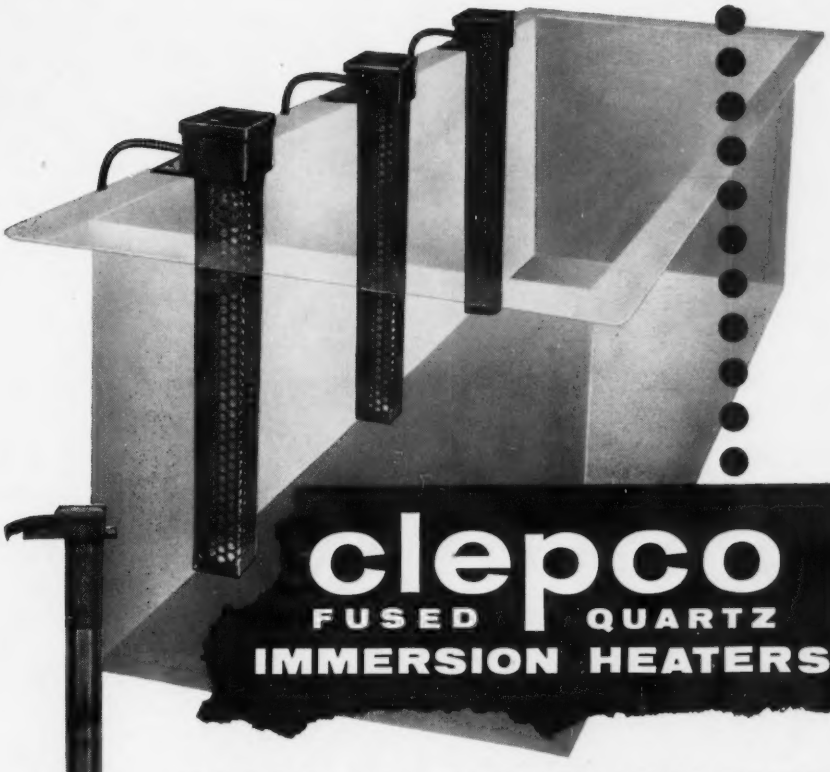
MARCH ADVERTISERS' INDEX

Abbott Ball Co. 22
Agate Lacquer Mfg. Co., Inc. 165
Alchemize Corp. 120
Allied Chemical Corp., Solvay Process Div. .. 19
Allied Research Products, Inc. 67
Almco, Queen Products Div.,
King-Seeley Corp. 119
Alvey-Ferguson Co. 75
American Machine and Metals, Inc.,
DeBothezat Fans Div. 24
American Smelting & Refining Co.,
Federated Metals Div. 127
American Titanium Corp. 162
Apex Alkali Products Co. 68
Automotive Rubber Co., Inc. 4
Bacon Felt Co. 6
Baird Machine Co. 122
Baron Industries 124
Belke Mfg. Co. 91
Better Finishes & Coatings, Inc. 123
Binks Mfg. Co. 16-17
Blakeslee & Co., G. S. 167
Bond Chemical Products Co. 114
Brady Co., W. H. 132
Carbic-Hoechst Corp. 53
Carborundum Co. 89
Cincinnati Cleaning & Finishing Mchry. Co. 71
Circo Equipment Co. 84
Cleveland Process Corp. ..... Third Cover
Clinton Co. 105
Clinton Supply Co. 132
Cohn Mfg. Co., Inc., Sigmund 102
Commercial Filters Corp. 12
Cowles Chemical Co. 30
Crescent Bronze Powder Co. 92
D & W Tool & Findings, Inc. 96
DeBothezat Fans Div.,
American Machine & Metals, Inc. 24
Detrex Chemical Industries, Inc. 63
Detro Mfg. & Sales Co., Inc. 134
DeVilbiss Co. 48, 49
Diamond Alkali Co. 8
Dixon & Rippel, Inc. 136
Dry Clime Lamp Corp. 66
duVerre, Inc. 136
Dyna-Empire, Inc. 70
Dytex Chemical Co. 118
Enthone, Inc. 73
Engelhard Industries, Inc. 15
Federated Metals Div. 127
Flexo Products, Inc. 88
Fortune Industries, Inc. 138
Fostoria Corp. 87
G. S. Plastics Co. 3
Gardner Laboratory, Inc. 160
Gasway Corp. 10
Grav-I-Flo Corp. 14
Gray Co., Inc. 149
Gumm Chemical Co., Inc., Frederick 90
Gyromat Corp. 108, 109
Hammond Machinery Builders, Inc. 7
Hanson-Van Winkle-
Munning Co. .. 26, 27, 100, 101, Fourth Cover
Harper Buffing Machine Co. 125
Harshaw Chemical Co. 57
Heatbath Corp. 41
Hill Acme Co. 18
Hooker Chemical Corp. 131
Hull & Co., Inc., R. O. ..... Second Cover
Kalamazoo Tank & Silo Co. 104
Kirk & Blum Mfg. Co. 129
Klem Chemicals, Inc. 141
Kramer Co., H. W. 151
Kushner Electroplating School 160
Lea Mfg. Co. 159
LeVita Industries, Inc. 140
Magnus Chemical Co., Inc. 83
Magnuson Products Corp. 74
Masters' Electro-Plating Assn., Inc. 130
Mearl Corp. 97
Mechanical Process Co., Inc. 139
Metal Finish, Inc. 116
Metalwash Machinery Corp. 25
Metaplast Process, Inc. 128
Michigan Chrome & Chemical Co. 23
Miller Corp., Harry 135
Miracle Paint Rejuvenator Co. 164
Morse Mfg. Co., Inc. 164
Murray-Way Corp. 107
Neilson Chemical Co. 93
New Holland Machine Co. 98
Nordson Corp. 80, 81
Norton Co. 2
Nuodex Products Co. 9
Oakite Products, Inc. 1
Park Chemical Co. 161
Parker Rust Proof Co. 77
Pennsalt Chemicals Corp. 13
Phillips Mfg. Co. 95
Pioneer Rubber Co. 94
Potter Paint Co., Inc. 126
Rampe Mfg. Co. 28
Randolph Products Co. 139
Ransburg Electro-Coating Corp. 69
Ransohoff/Roto-Finish 79
Rapid Electric Co. 111
Reynolds Chemical Products Co. 133
Rockwell Co., W. S. 110
Ross Engineering, J. O.,
Div. of Midland-Ross Corp. 137
Sandoz, Inc. 29
Sel-Rex Corp. 117
Sethco Mfg. Co. 157
Simplicity Engineering Co. 106
Solvay Process Div., Allied Chemical Corp. .. 19
Solvents & Chemicals Group 112, 113
Spra-Con Co. 121
Spraying Systems Co. 82
Stevens, Inc., Frederic B. 115
Stutz Co. 86
Sulphur Products Co., Inc. 162
Surety Rubber Co. 76
Syntron Co. 155
Technic, Inc. 11
Tenax Finishing Products Co. 85
Ti-Co Industries, Inc. 160
Timesaver Sanders 99
True Brite Chemical Products Co. 96
Udylite Corp. 20, 21, 65
Vitro Chemical Co. 103



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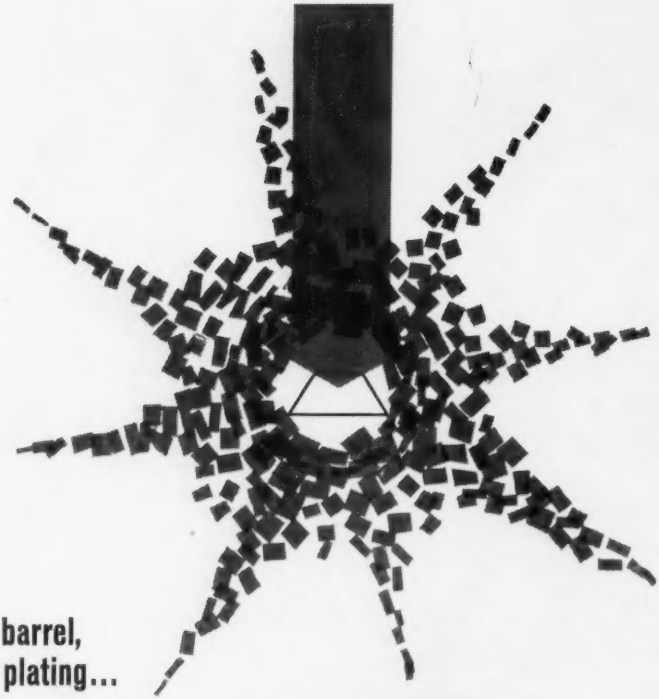

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